ENVIRONMENTAL ASSESSMENT BOARD

Ontario

ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 153

DATE: Thursday, May 28, 1992

BEFORE:

HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act, R.S.O. 1980, c. 140, as amended, and Regulations thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro consisting of a program in respect of activities associated with meeting future electricity requirements in Ontario.

Held on the 5th Floor, 2200 Yonge Street, Toronto, Ontario, Thursday, the 28th day of May, 1992, commencing at 10:00 a.m.

VOLUME 153

B E F O R E :

THE HON. MR. JUSTICE E. SAUNDERS	Chairman
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MS. G. PATTERSON	Member

S T A F F :

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L I S T o f E X H I B I T S

L I S T o f U N D E R T A K I N G S

TIME NOTATIONS

---Upon commencing at 10:04 a.m.

THE REGISTRAR: Please come to order. This hearing is now in session. Please be seated

THE CHAIRMAN: Mr. Greenspoon?

MR. GREENSPOON: Thank you, Mr. Chairman.

AMIR SHALABY,
JOHN KENNETH SNELSON,
JANE BERNICE TENNYSON,
FREDERICK GEORGE LONG,
BRIAN PAUL WILLIAM DALZIEL,
HELEN ANNE HOWES; Resumed.

CROSS-EXAMINATION BY MR. GREENSPOON (Cont'd):

Q. Mr. Dalziel, we ended yesterday at the point where we were talking about the plans that Hydro has formulated, the illustrative plans, and the one particular plan that was closest to what I could call a no-growth scenario, perhaps, where I put to you that there would be no supply, and the closest plan that Ontario Hydro has to no supply is found on page D2-1, that's the 1992 DSP Update, lower load growth case, LVH1AROP.

MR. DALZIEL: A. That's the one with no new major supply. It does have the supply associated with the hydraulic option and it does include the Manitoba Purchase.

Q. But the supply associated the hydraulic option is deferred until the end of the

planning period. If you look at the --

A. That's correct, they are.

Q. Hydraulic developments that are referred towards the end of the planning period. So that is around 2014, or thereabouts?

A. Between the period 2007 to 2014.

Q. All right. And I don't see any mention of Little Jackfish in that plan. I notice that on page 22 of the Update we see that one of the ways of managing the surplus to have been cancelling Little Jackfish.

Do you know what Little Jackfish's status is, Mr. Snelson, on D2-1, Mr. Dalziel?

A. There are two projects that are not included as part of the hydraulic option in this case, one is Little Jackfish, the other is Ragged Chute is not included either.

Q. Where do I find that? I don't see that on D2-1. Do I have to look at the charts to see that?

A. Yes, you would have to look at the chart on page D2-3.

Q. And where does that tell me that Little Jackfish is cancelled?

A. If you look down the left-hand side

of the page, the descriptions, you will find a column called Uncommitted Hydraulic.

Q. Yes?

A. And if we run across that line and if we were familiar with the capacity characteristics associated with the Little Jackfish site and Ragged Chute there is no capacity of 132 megawatts and 98 megawatts.

Q. That's a tricky way to have to find it, but I take your word for it.

Now, if we look at getting back to environmental impacts of the plans, if we look at D2-9, certainly prior to the year 2008, or inclusive of the year 2008, this appears to me to be the only plan that reduces SO(2), NOx and CO(2), would you agree with that?

MS. HOWES: A. I would say that those emissions are lowest.

If you just look at figure C-3, though, if you look beyond the period, there may be some issue with respect to CO(2), but generally these are lower emissions.

Q. Yes, I said inclusive of 2008.

A. 8, yes.

Q. And just one last point on this. If

you turn to page 7 of the Update, Exhibit 452, this is the forecast that we are talking about, that is the line starting around the 23, 24 gigawatt and then reducing to almost 20 by the year 2006. Is that the forecast that this plan is designed to meet?

MR. DALZIEL: A. That's correct.

Q. And just going back to what we talked about yesterday, that forecast would be the most in keeping with the Exhibit 688 that I filed, that is Beyond the Limits. Would you agree with that, Ms. Howes?

That is a forecast that saw no growth in the society?

MS. HOWES: A. I am not sure that I can draw that conclusion from the few pages of the document I saw.

Q. Let's take the predecessor to that document then that you said you had read, the Limits to Growth?

A. Limits to Growth.

I would agree that this particular plan is the lowest of the ones that we looked at. I'm not sure that based on my recollection of the document I probably read in 1972, that I could draw that conclusion.

Q. Okay. I don't think anything turns on that.

Just one last thing on this. If you look to D2-6.

THE CHAIRMAN: Back at 686?

MR. GREENSPOON: Yes, that's correct.

Q. We are still talking the no-growth plan, if I could call it that, with the exception of Manitoba. The Manitoba Purchase doesn't come into play until around 1999 and never really plays a big part in supply, does it, Mr. Dalziel? Relatively speaking, it's a pretty minor part of the energy future for Ontario.

MR. DALZIEL: A. Compared to the energy associated with the existing system, it is a small component, but perhaps compared to the amounts of energy required above an existing level of demand, in this case it would represent a significant contribution.

Q. Well, for example, demand reducing options, purchase NUGs, are as big and later bigger than the Manitoba Purchase?

A. That's correct.

Q. So that managing the surplus that we read about on page 22 of the Update, when Hydro says if

the surplus were to materialize there would be adverse rate impacts for customers as a result of paying for the costs of non-utility generation and demand management that is not required, we could just as easily say if the surplus were to materialize there would be adverse rate impacts for customers as a result of paying for the costs of the Manitoba Purchase.

DR. LONG: A. Could you repeat that question?

Q. Well, maybe you should turn to page 22 of the Update because I am just reading directly from it.

A. I have that.

Q. You see the big paragraph in the middle of the page?

A. Yes.

Q. And the second sentence, if the surplus were to materialize, now I read that sentence and then I said, it could just as easily be said or read that if the surplus were to materialize there would be adverse impacts for customers as a result of paying for the costs of the Manitoba Purchase.

A. I guess to the extent that a contract exists, I'm not sure that the same conclusion can be drawn in this case.

Q. And is that because of the penalty clause? Is that what you mean by that fact that a contract exists?

[10:15 a.m.]

A. I'm not that familiar with all the details of the contract, but my understanding is that it is not entirely within our powers to just cancel the contract. My belief is that it is tied to gaining the necessary environmental approvals.

Q. All right. Well, let's just look at it from an environmental assessment point of view, and that is what we are here for, is to weigh the options one against the other.

Leaving aside the fact that there is a contract, whatever material difference that may make, and I'm sure that this will be argued more fully at later date, but you would agree with me that when you are managing a surplus the Manitoba Purchase is as much a part of the surplus in the future as NUGs or DSM, and it is a matter of which ones we choose?

A. I would agree that we have some choices in the manner in which we can manage the surplus, yes.

Q. All right. And if we go to Exhibit 3, just before page 7-11, Mr. Snelson, I am not the

sure whether Dr. Long or you would answer this, but when we look at evaluating the Manitoba Purchase we have got to count two costs. We have got to count the cost of power and the cost of the transmission?

MR. SNELSON: A. Yes.

Q. That is the cost to the customer, to Ontario Hydro?

A. Yes, in very simple terms.

Q. And when you look at page 7-11, figure 7-5, where electricity is used in Ontario, you see that only 5 per cent of the electricity is used in the northwest and 8 per cent in the northeast, and I put to you that even that is somewhat misleading because, at least where that circle is found, it is common knowledge that most of the electricity that is used in the northeast is used at the southern end of the northeast; that is, the corridor from Sault Ste. Marie to North Bay?

You have Inco, Falconbridge, E.B. Eddy, Algoma Steel, all the lumber companies on the Ottawa River, that is where most of the electricity is used in Northeastern Ontario?

A. I believe that is probably true. I haven't analyzed it, but the larger centres such as Sudbury, North Bay, and Sault Ste. Marie may not --

yes, Sault Ste. Marie would be counted if this is all of Ontario, yes.

Q. Yes. Even though it is a different utility.

A. That's correct.

Q. And the circle we see there for Hydro's regionalization of the province, it probably puts it in the middle geographically, but it appears to me that is somewhere north of Timmins or Cochrane?

A. I don't think there was any significance intended from the placement of the circle, other than to identify Ontario Hydro's northeast region.

Q. All right. Let's just say for convenience sake that if you drew that line across Georgian Bay -- you see the Georgian Bay line there, 7 per cent, Georgian Bay, on the left of figure 7-5?

A. Yes.

Q. The line that points to the -- and then goes down south?

A. Yes.

Q. If you drew that line across and I will put a figure to you and you can tell me if it is reasonable. From there north you probably have 6 per cent at the most?

A. You are including the 5 per cent for --

Q. I am including the 5 per cent and I am adding about 1 per cent, because that line puts you north of the Sault, it puts you north of Sudbury, and it almost puts you north of Timmins.

A. I couldn't comment other than the discussion we have already had that some of the major populations and industrial centres are south of that.

Q. Certainly, substantially it can't be any greater than 13 per cent, obviously.

A. Yes.

Q. And it is probably towards the lower end of that 8 per cent plus the 5 per cent.

A. Given the distribution of population and industry that is probably the case.

Q. So then we are going to look at with Ontario Hydro's Manitoba Purchase a 9,000 hectare swath from that line to the Manitoba border for transmission? 9,000 hectares, Dr. Tennyson?

DR. TENNYSON: A. That is about right. On Panel 7 I think it was 8,800.

Q. And how in planning has that been weighed against the cost of the Manitoba Purchase, against the benefits of the electricity coming into

Ontario?

THE CHAIRMAN: You will remember that this was all discussed quite extensively in Panel 7.

MR. GREENSPOON: Well, I don't want to talk about environmental impacts, Mr. Chairman. My understanding about the purpose of --

THE CHAIRMAN: No, no. All the reasons that you are talking about now were all explored in Panel 7.

What is your question to this panel? That is what I am trying to get at.

MR. GREENSPOON: Well, I thought we were here in this panel to determine how Hydro --

THE CHAIRMAN: Yes, okay. Ask them a question. That is what I am trying to get at.

MR. GREENSPOON: Q. Well, the question is: How in planning do you make the decision to choose the Manitoba Purchase over non-utility generation or demand management or other options, weighing the impact on 9,000 hectares of northeastern and northwestern Ontario?

MR. SNELSON: A. The area of the transmission line is one of the factors that is identified as one of the characteristics of that option. I believe it is in the Options Comparison

tables which are part of the witness statement.

Q. The supplementary witness statement?

A. Yes. Exhibit 646.

Q. Well, maybe I will be more specific. What are the benefits to Northeastern and Northwestern Ontario of the Manitoba Purchase?

A. I think we have indicated that the transmission, the strengthening of the transmission system through Northern Ontario is of significant benefit in terms of better integration of the electricity system in Ontario. It provides a long-term benefit in terms of the integration of Northwestern Ontario in particular into the rest of the system to provide for better scheduling of generation, which tends to reduce system cost.

It may also have benefits in terms of better planning of the system in Northern Ontario in that with a stronger transmission system then there is a wider choice of options for planning in the North.

There is the ability to accommodate changes in load either up or down in the North as a result of whatever circumstances that might arise.

Q. But I don't understand that. If a system uses 5 per cent of the provincial electricity and already has electricity flowing south, for example

from Atikokan, how can it be an advantage to make that system bigger?

A. I think that we have indicated that Northern Ontario in general over much of the last 20 or 30 years has been a net importer of electricity.

Q. All right. You agreed with me that, I think - or if you didn't, Ontario Hydro has certainly agreed - that there is a lot of cogeneration potential in Northeastern and Northwestern Ontario. That is where most of it is?

A. There is a lot of cogeneration potential --

Q. And we talked yesterday about a possibility of about 1,000 megawatts in the pulp and paper industry alone, and you didn't disagree with that number?

A. I didn't disagree with that number. I didn't agree with it either. I just said it is a large number.

Q. And there is a line running from Manitoba to Toronto right now, isn't there?

A. There is a transmission system that runs from the Manitoba border, including the transmission in Northwestern Ontario, Northeastern Ontario and to Toronto.

Q. And wouldn't it make more sense in terms of cost to the province and in terms of impacts on the environment to maximize cogeneration and non-utility generation along that line rather than moving electricity all the way from Manitoba to Toronto?

A. I think you have to weigh all of the costs and benefits of those options. We have discussed the benefit of the transmission line, and it does provide flexibility in some respects which cogeneration would not.

Q. Certainly, if you had a philosophy of local indigenous supply it wouldn't encompass this kind of a purchase, this kind of a transmission corridor?

A. Are you categorizing cogeneration as local indigenous supply?

Q. Any kind of non-utility generation.

[10:30 a.m.]

A. Well, non-utility generation is just a definition of who owns it, it's not a question of where the resources come from.

Q. Let's limit the definition then to renewable non-utility generation and cogeneration.

A. Cogeneration largely relies upon natural gas, which is an imported resource into the

province.

Q. Yes, but it's natural gas that's being used industrially anyway and all cogeneration does is make the use of that more efficient by producing electricity?

A. No.

Q. Why do you say no?

A. Because to cogenerate you require additional supplies of natural gas.

Q. But you are using the gas that you were already using more efficiently.

A. No.

Q. You are not?

A. No.

Q. Well, that certainly wasn't the evidence that we heard from Panel 5.

A. You are using natural gas to produce electricity much more efficiency than if you used natural gas to produce electricity in an electricity-only natural gas facility. But to produce electricity by cogeneration from a place that currently uses natural gas to raise steam, then the use of natural gas to raise steam can be quite efficient already.

The additional natural gas that you need

to generate electricity is less than the initial natural gas you would need to generate the same amount of electricity in a non-cogenerating plant.

Q. I will leave that for now.

Why is it that Ontario Hydro is proceeding with concurrent environmental assessments with respect to the Manitoba Purchase?

A. I think there are at least two reasons. One is that that is the most expeditious way and probably the only way in which we can have the transmission schedule such that we can have the transmission in time to acquire the purchase, and the second reason is that the provincial government in its new energy directions instructed Ontario Hydro to move forward expeditiously with the environmental assessment of the Manitoba Purchase transmission.

Q. And in fact, Ontario Hydro has already commenced environmental assessment processes for a line from the greater Toronto area to Hanmer, which is just north of Sudbury, and as well from Hanmer to Hunta, which is around Timmins; is that right?

A. Yes.

Q. And is this not another example of prejudging a decision from this Panel, such as the penalty clause in the contract with Manitoba?

A. No.

Q. You don't feel you are painting this Board into a corner with respect to making its decision?

MR. B. CAMPBELL: Mr. Chairman, we have been around this several times, it's come up throughout. I don't think this is an appropriate question to put to a witness.

If Mr. Greenspoon has some arguments he wants to make on this matter, at an appropriate time I would be pleased to deal with them in that context. But I do believe, in my submission, this is an appropriate cross-examination.

THE CHAIRMAN: He has already asked the question, the answer is no.

MR. B. CAMPBELL: It was the next question.

MR. GREENSPOON: Q. Isn't it true that Ontario Hydro sees Northern Ontario as a resource sink for electricity for the south?

MR. SNELSON: A. No.

Q. Why do we need a big swath from Hanmer to Ontario? What is the purpose of it?

THE CHAIRMAN: Mr. Greenspoon, we went through all this in Panel 7. You have asked that

question before and I think they have answered it the best they can. The question is argumentative, furthermore.

MR. GREENSPOON: Q. What about the reliability of Manitoba, Mr. Snelson, have the hearings started as of today, do you know?

THE CHAIRMAN: Perhaps you could ask him if there is anything additional that they know about the process in Manitoba that they didn't know when Panel 7 was on. Perhaps I will ask that question.

MR. SNELSON: The answer to that question is that I don't know of anything additional.

THE CHAIRMAN: All right.

MR. GREENSPOON: Q. What is the planning process if the Manitoba Purchase from that end is not approved environmentally in the Province of Manitoba, if they don't get an environmental approval either because of a federal process or a provincial process?

MR. SNELSON: A. I'm not sure as precisely how that is defined in terms of the contract. The contract specifies certain penalty clauses if Ontario Hydro fails to get it's approvals, I believe there is some corresponding provision if they fail to get their approvals, but I am not as familiar as Mr. Huggins was with the details of those contract

provisions.

Q. All right. But again, Ontario Hydro doesn't have a plan that anticipates no Manitoba Purchase and no growth, although you do have a scenario as we heard in direct evidence for managing not getting the Manitoba Purchase.

A. As we have indicated, there are uncertainties associated with all the options that we are pursuing and that's part of the management of the system and its plans. And we do look at scenarios that say, as you have seen, what happens with lower growth, what happens with higher growth. And as I indicated in my direct evidence, those scenarios also cover off what happens if the need for resources is higher because some other resource doesn't come along as planned.

Q. Now, in terms of managing the surplus, has there been any planning with respect to retubing? Has there been any contingency?

I notice that in all of the plans there seems to be a balancing between mothballing and bringing back fossil. I see no mention about contingencies for retubing the nuclear plants. Has there been any planning decisions made with respect to that?

A. The planning assumes a schedule for

retubing plants, retubing nuclear plants, which is based on the physical expectation of when those plants need to be retubed, and I believe Panel 9 have probably discussed that at some extent length--

Q. Yes. I was just wondering from a planning point of view?

A. --and that schedule at times is modified from a planning point of view because of planning considerations by advancing dates by a few years if that's better from a planning point of view.

Q. But in terms of mothballing, there is no analogous way of dealing with a nuclear plant. You either retube it or you shut it down. From a planning perspective you don't have the flexibility, whereas in all the plans we can look at, you are going to mothball Lakeview, you are going to bring it back on later on. You have a lot of movement in your plans, in all of the ten or so scenarios that you put forward in your supplementary witness statement, but nowhere we do we see a revision in the schedule of retubing?

A. I think retubing and mothballing are quite separate things.

Q. Of course they are. But just from a flexibility point of view, we don't see anywhere in any of your plans Bruce will not be retubed?

A. I don't believe that we have that scenario in, though in the decisions to rehabilitate Bruce, then consideration was given to what happens, what would happen if you didn't rehabilitate them, then retired the plant.

Q. Yes, we heard that evidence in Panel 9.

And the same thing with respect to managing the surplus when you come to the three units at Darlington that haven't yet been fired up, there is nowhere in any of your scenarios where those units don't get fired up?

A. I don't believe there is. I don't believe there is.

Q. And all of those ways from a planning perspective are ways that the surplus could be managed, Bruce not being retubed, Darlington not being fired up?

A. Those would be ways of managing surplus, they wouldn't necessarily be the best ways of managing the surplus.

Q. And you have looked at those, have you?

A. In a judgmental way in deciding what to look at, then you select those options that you think are most likely to be beneficial as being ones

that you look at. And so, those are considerations that would be taken into account judgmentally.

Q. Now, Mr. Shalaby, I wanted to talk for a minute on DSM.

I recall having a discussion not on the record with Mr. Burke about energy efficient light bulbs, and when I told him that I changed all my light bulbs in my house to energy efficient light bulbs, he told me that probably only two or three of them were economic, the ones that I used a lot. But would it be fair to say the more the rates go up, and the rates are going up, the more the rates go up the more economic those energy efficient light bulbs become; isn't that true?

MR. SHALABY: A. The more they save you money. The sense of economic as you recall that we use is the total customer cost, which is somewhat independent of rates.

Q. But if Ontario Hydro's mandate is to deliver inexpensive electricity, from my point of view as a customer, the best way to do that is to reduce my Hydro bill.

A. I accept that.

Q. And the higher the rates go, the more economic sense a light bulb, an energy efficient light

bulb makes to me as a customer?

A. I agree with that.

Q. And if we look at a couple of utilities in the United States, Southern California Edison and Pacific Gas and Electric, are you aware that both of those utilities have planned to meet their supply, their demand for the next 10 years or more from efficiency and renewables, two-thirds efficiency in the case of the South California Edison and three quarters efficiency in the case of Pacific Gas and Electric?

A. Those number do not surprise me.

Q. And Pacific Gas and Electric is I think about a 20 gigawatt utility, peak?

A. That's about right.

Q. Very similar to Ontario Hydro?

A. I thought it was smaller than Ontario Hydro. I thought it was about 12 or 13 gigawatt peak.

Q. The number I got last night talking to Amory Lovins was 20 gigawatts. I have no other information.

If it is 20 gigawatts, it's around the same size of Ontario Hydro?

A. If it is. It's likely smaller. If it is closer to my recollection, it's about half.

Q. It's a large utility.

A. That much I can agree with you. It's the largest industrial utility in the United States.

Q. And from a planning perspective, meeting three quarters of the their demand with conservation and efficiency is certainly a different plan than you have at Ontario Hydro.

A. I wouldn't agree with that.

q. You wouldn't agree?

A. No.

Q. Does Ontario Hydro plan to meet three quarters of its future demand with conservation and efficiency?

A. If you look in the 1990s, I don't think we are far off that, yes.

Q. All right. When we look at the charts of the three supply scenarios, starting with page 29 --

A. I see the Board members perhaps trying to find something to support the percentage of the demand management to meet the demand in the 90s, so perhaps we can try to spend a minute to try and find some graphs that will give us some indication of that.

[10:41 a.m.]

Q. What are you looking at, Mr. Shalaby?

A. I am trying to find a graph that

would give us sense of how much demand management is meeting increase in demand.

THE CHAIRMAN: Look at 119 of your overhead.

MR. B. CAMPBELL: All right.

MR. SHALABY: This helping each other goes both ways here. That's very nice. Yes, 119 is an excellent choice, Mr. Chairman.

MR. GREENSPOON: Q. If we look at page 29 of this same document that is the -- at least, in my copy you can overlay page 29 over page 30 and 31 and 32, which are the three plans, and you can see that those follow the same pattern; is that fair to say?

MR. SHALABY: A. They follow the same pattern. The scale is not exactly the same.

Q. Not exactly the same.

A. You can't really see through it.

Q. No. Right. We talked a little bit about the impact of the tailings yesterday and Ontario Hydro's, I think you agreed with me, Ms. Howes, that certainly it was an indirect impact of generating nuclear electricity?

MS. HOWES: A. Yes, but we also agreed that it was a highly regulated industry and there were other players.

Q. Well, I didn't agree with that, but you said that.

A. Oh, okay. Yes, indeed, I did say that.

Q. And there will be more tailings generated by the time 2009-and-a-half comes along if we look at page 30, both in Elliot Lake and Saskatchewan, I take it, if Ontario Hydro continues to operate Darlington, Bruce and Pickering?

A. Indeed, if more uranium was required there would be some more tailings. I guess it is not clear to me where we are purchasing the uranium from. There would be some purchase from Elliot Lake I think in the '90s. I'm not sure beyond that point.

Q. Well, it is an impact somewhere certainly?

A. I will give you that.

Q. And in terms of the past it certainly may not be a topic directly connected to this hearing, but does Ontario Hydro have any plans to do any rehabilitation in Elliot Lake?

THE CHAIRMAN: Well, now, again this was a matter which was discussed and answered, I thought, by the Panel 9 witnesses.

MS. HOWES: That's correct. It was.

MR. GREENSPOON: Q. Well, just to confirm, you don't have any plans to do rehabilitation in Elliot Lake?

THE CHAIRMAN: I think if I recall - and I don't always trust my memory - that they have no physical plans, but that they may make a monetary contribution. I think that was what --

MR. B. CAMPBELL: I think they are contractual requirements to meet the regulatory requirements. There was discussion of the Stanleigh Mine in particular.

MS. HOWES: That's right.

MR. B. CAMPBELL: I think if the question is as simple as will Ontario Hydro personnel themselves be doing the work, that is not I think the nature of the obligation, but there are contractual obligations as a result of the contracts with Hydro to do rehabilitation work, as I understand the evidence.

MR. GREENSPOON: Q. All right. Assuming that the contracts end in '94 and Ontario Hydro doesn't buy any more uranium from Elliot Lake, then in 2009.5 when we start...I guess that is a CANDU 6 on page 30, will Ontario Hydro have any regard to the situation in Elliot Lake when it determines whether or not they are going to start up that nuclear reactor?

In other words, would Ontario Hydro be willing to agree not to start up any more nuclear reactors in Ontario unless the tailings had been rehabilitated or commenced to be rehabilitated in Elliot Lake?

MS. HOWES: A. I'm not sure I am able to answer that question.

Q. And from a planning point of view, Mr. Snelson, I am struck by eight or nine -- I guess I could count them quickly. There are nine nuclear 670 megawatt plants built from 2009-and-a-half to 2015. In a period of six years we are building nine CANDU 6s. This looks a lot like the planning in the 70s when there was going to be CANDU "A"s all up and down the -- Lake Huron and Lake Superior.

MR. SNELSON: A. Well, you have pointed out the number of nuclear reactors in this scenario.

I would point out that this is just one illustrative way of meeting the major supply requirements post-2009 and that there are other ways. We have indicated the way using fossil options, and we have also indicated with an enhanced plan some other options that might make part of that.

As to the comparison with the 1970s, I'm not quite sure that this is comparable to that.

Q. Well, in the 70s you were forecasting in the 90s that you would need about 60,000 megawatts today and we are using about 24. And the thrust, I think you can gather, of my cross-examination yesterday was questioning whether we are going to in fact have this growth in 2009.

A. And that is one of the reasons why we are not seeking approvals for major supply options at this time.

Q. So do you admit, then, Mr. Snelson, that it is possible that there will not be the forecast growth that we see on page 29 of the overheads?

A. Our own load forecast uncertainty bands cover a very wide range as you have pointed out, including a lower range where there is very little growth.

Q. And if the Board is to comment on the -- I forget the wording, as Ms. Patterson said, to give you guidance with respect to these, given the difficulties that Ontario Hydro has had with the CANDU "A" with the retubing and a lot of the things we heard on Panel 9, what is the planning perspective on the reliability of the CANDU 6 in putting - at least with this scenario, and I realize you say it is only illustrative - putting all your eggs in one basket, so

to speak, with nine CANDU 6s where we don't have any in Ontario?

A. Well, I think these are decisions that have yet to be addressed. We have looked at scenarios where all of the base -- we have shown you in update nuclear where all of the base load requirement is provided by nuclear; we have shown in update fossil where it was all provided by fossil.

There are possibilities of intermediate scenarios that place less reliance on one or other of those options.

Q. And from a planning perspective, then, I take what you are saying is it is better off -- we are better off to have a mix?

A. Well, we have a mix on the existing system, and we are all the while augmenting that system and the mix is shifting over time.

Q. But you haven't given us a mix in 2009. You have shown us three scenarios, one of which could be said to be mixed to some extent, but all of which show growth.

A. The median scenarios show growth. We have also shown you a low scenario that has very little growth.

Q. Yes. And that scenario that shows

little growth would have the least environmental impacts; you agree with that?

A. It would probably have the least impacts on the natural environment.

THE CHAIRMAN: I think they have already agreed with that earlier on this morning and maybe also yesterday afternoon.

MR. GREENSPOON: I am almost done, Mr. Chairman.

Q. And with respect to the planning of the hydraulic projects, particularly Little Jackfish and Patten Post do they appear in all three of the median scenarios?

MR. SNELSON: A. Patten Post is in all the median scenarios. Little Jackfish is in the unmanaged surplus median scenarios but not in the managed surplus median scenarios.

MR. GREENSPOON: Those are all my questions. Thank you, Panel.

THE CHAIRMAN: Mr. Heintzman?

MR. HEINTZMAN: Mr. Chairman, Ms. Findlay is with me to keep me pointed in the right direction, and David Hamer may continue with further questions in specific areas after I have finished.

CROSS-EXAMINATION BY MR. HEINTZMAN:

Q. Mr. Snelson and Mr. Shalaby and Mr. Dalziel, I would like to pick up on a point that was discussed by you yesterday with the Chairman and Dr. Connell as a result of a question asked by Mr. Rodger, and that is the effect of the moratorium.

As I understand the answer given by I think Mr. Shalaby or Mr. Snelson in preparation of the Update, the moratorium was a given?

MR. SNELSON: A. That is correct.

Q. And by that I understand you to mean that it was given by the government to you as planners and Ontario Hydro?

A. Yes, I believe it was a provincial government policy direction as part of the new energy directions in November, 1990.

Q. To you as a planner?

A. It was a policy direction to Ontario Hydro.

Q. And therefore to you as a planner within Ontario Hydro?

A. Ontario Hydro's plans are prepared within the framework of provincial government policy where it applies.

Q. Well, do you have any problem with my

putting it to you as a planner?

A. It was put to all of the people who were working on the plans and to all of the people in Ontario Hydro who develop, approve, and so on, plans.

Q. Does that include you as a planner?

A. Yes.

Q. Yes. Thank you. And it was a directive? You considered it a directive within the parameters that it was given?

A. Yes.

Q. Yes. And as I understand what you said yesterday and Mr. Campbell said when he stood up, that you didn't consider it a directive in the long term. You felt that you could leave nuclear on the table in the long term?

A. Yes.

THE CHAIRMAN: Well, just a moment. That is not how it was put.

[10:55 a.m.]

Let's be clear. My impression of what moratorium was, it was simply a request to suspend certain specific work that was being done at that particular time for an indefinite period of time.

MR. B. CAMPBELL: That's exactly correct, Mr. Chairman.

MR. HEINTZMAN: What I am asking now is the impact of the moratorium on the planning that lead up to the Update. That's where I'm going to.

THE CHAIRMAN: Okay.

MR. HEINTZMAN: Q. So we now have the directive being not directed to the long-term, it was directed to the short-term in your planning horizon.

MR. SNELSON: A. We were told to suspend and not to carry out preliminary engineering for nuclear options.

Q. Yes. But I am talking about the planning process that you as a planner, you have told me that you considered it to be a directive within the parameter that was given, you have told us yesterday that that parameter did not include the long-term; right?

A. That is correct.

Q. So it was a directive given that had application within the short-term, as a planner?

A. Yes.

Q. Right.

A. Though the length of time that it would apply was undefined, but we did consider that it may not be forever.

Q. Yes. And the short-term in your

perspective in terms of this process was the five-year approval period?

A. No.

Q. What other short-term period are we working with other than the five-year approval process?

A. I believe that there were assumptions made for planning that the nuclear moratorium might be lifted as early as 1993. It wasn't an assumption that it would be lifted, but we did not exclude things that required work on nuclear options post 1993.

Q. But that's not a planning matter, that is a question of what engineering work you are going to do.

A. It could affect the schedules that that would become a planning matter.

Q. Yes. But for a planning perspective, what you are telling us is that you considered it a directive within the short-term.

A. It was a directive as to what preliminary engineering we could do within the short-term.

Q. No, I don't want to talk about what preliminary engineering you could do. From a planning perspective, and the Update is a planning document; correct?

A. Yes.

Q. That's what I am trying to focus on. The planning perspective, you as a planner considered it to be directive?

A. Yes.

Q. Right. You didn't consider it to be a directive in the long-term?

A. Yes.

Q. You considered it to be a directive in the short-term?

A. Yes.

Q. All right. Now, the short-term for you was the five-year approval period?

A. No.

MR. B. CAMPBELL: Mr. Chairman --

THE CHAIRMAN: Let him answer.

MR. B. CAMPBELL: My point, Mr. Chairman is that he has already answered the question.

THE CHAIRMAN: That may be so, but let us have the answer to that.

MR. SNELSON: The short-term in this context is not the five-year planning period.

MR. HEINTZMAN: Q. What other short-term period are we dealing with?

THE CHAIRMAN: Just a moment. I thought

Mr. Snelson said today, and this is a repetition of what was said at earlier panels, that Hydro proceeded on the basis that there was a possibility that this moratorium might be lifted as early as 1993. That's what I thought they said before and they said again today. That was the planning framework that they were working in.

Now, whether that's short term, long, medium term, whatever, I don't know.

MR. HEINTZMAN: Q. That may be true and it may be lifted in 1993, but it hasn't within lifted or it wasn't lifted at the time you prepared the Update.

MR. SNELSON: A. That is correct.

Q. So that's what I am trying to get at, the effect it had on you as a planner. I am suggesting that there sitting in November of 1991 you had a nuclear moratorium.

A. Yes.

Q. You were taking that as a short-term planning directive?

A. Yes. The short-term that you were working with in your Update was the five-year approval process?

A. No, not with respect to the nuclear

moratorium.

Q. Well, I am having trouble discerning how it could be otherwise. Because you have told the Chairman yesterday that if nothing had happened, i.e., you hadn't prepared the Update, but we had the same DSM as we have had and we had the same NUGs as we have had, and we had the nuclear moratorium, what we would have was Plan 15 or Plan 22 or Plan 23 before the Board; right?

A. No, I don't believe I did say that. Well, if we didn't have the Update, yes, they would be in front of the Board, but there would still be a need to do an update.

Q. Well, the Update would be done by way of submissions to this Board and the evidence before the Board and the Board would have to make a decision based upon the evidence and your evidence in this panel as to what the appropriate approvals would be; right?

A. Yes.

Q. Right. But the one thing that the Update does is take the five-year approvals off the table; right?

A. It takes some of the approvals off the table.

Q. It takes all of the major supply

approvals off the table?

A. It takes all of the approvals off the table except for the Manitoba Purchase transmission and the new hydraulic.

Q. So it takes what we have been calling all the major supply approvals off the table?

A. It takes all the approvals off the table for major fossil and nuclear options, yes.

Q. I am suggesting to you that the inevitable logic of what has happened here is this: That you determined that you could not put forth an approvals case with nuclear as part of the major supply because of the nuclear moratorium; isn't that the fact?

A. No.

Q. And I suggest to you that the inevitable next decision you made was, if you had the nuclear supply off the table, you had to take the fossil off the table. That would be true, wouldn't it?

A. Well, it wasn't true in the case of the nuclear and it wasn't true in the case of the fossil.

Q. Well, others will judge that.

But if the nuclear had to be taken off the table because of the nuclear moratorium, certainly the fossil had to be taken off; wouldn't you agree with

that?

A. I wouldn't agree with that, no.

Q. Would you agree that responsibly you could put the major supply case forward without nuclear as one of the approval options and put forth an option having only fossil in it?

A. We could do that, yes.

Q. Well, you could, but you know that the five cases that were analyzed in their sort of latter day stages had one case in it which was entirely fossil, namely Case 26, all other cases had some nuclear in it; right?

A. That is correct.

Q. That is correct.

And that Case 26 was rejected - and we are going to go through in some detail - was rejected by the DSP in the final analysis and the three put forward, Case 15, Case 22 and Case 24, all have some or more nuclear?

A. Yes.

Q. Yes. So I am suggesting to you that as a responsible process you could not put forward a major supply case that did not have the nuclear as an alternative in that environment; could you?

A. The nuclear is an alternative.

Q. Yes.

A. It's an alternative in this proceeding too.

Q. If you are asking major new supply you couldn't put forth a scenario or a choice to this Board that did not include one that had some approval nuclear generation; could you?

A. I haven't agreed with that, and I don't agree with that.

Q. Well, why do you not agree with me based upon the logic of what we see in the DSP?

A. It's based upon the information that was available at the time of the DSP and the information available today.

Q. So, you say that you responsibly as a utility could put forward to this Board a selection of options which included fossil only alternatives; is that your evidence?

A. For approval, yes.

Q. Well, I suggest to you that what happened was, (A), you decided as a matter of directive you had to take off nuclear as included in the five-year approval process and that resulted in you taking off the fossil, and I will leave that with you there. But if that is the case, then you had to show

the nuclear coming on at a period in time at least outside the period of definition and acquisition after your estimation of when this Board would reach its decision plus five years?

A. I think you have the process backwards.

Q. Well, as we go through the alternatives, it won't be surprising if every one of the nuclear commencement dates is 2009 and 2010?

A. I'm sorry, is that a question?

Q. Yes. It won't be surprising to you that every plan we look at, the first nuclear commencement date on any projected major supply is 2009 or 2010, without exception?

A. The plans that are based upon the current situation where we are not seeking approvals, do show nuclear at later dates, 2009 or later.

Q. Without exception?

A. That is correct.

Q. Yes. And that happens to be what you, as you have already told us to be, the five-year approval process, plus one year, plus a 10-year acquisition or definition phase for nuclear?

A. That does correspond to about those dates, yes.

Q. Yes. And I am suggesting to you, sir, that based upon your answers yesterday to the chairman and the analysis that I have just given to you, that the only reasonable conclusion is that which I have put to you; namely, that you had to take nuclear generation off the table in the approval process for approvals within the five years because of the nuclear moratorium?

A. That's not correct.

Q. Now, in the DSP, sorry, Update, 452, as you have told us there are six plans - and I put this to any members of the panel, but I am talking to with you, Mr. Snelson - there are six plans which you discussed with Mr. Mark.

A. 452 discusses six plans, yes.

Q. And what I would like to do is, if I can, take out or compare apples to apples and good apples to good apples and not good apples to bad apples. That's the process I want to go through with you in of the next little while.

Now, looking at the three basic plans, the nuclear plan, the fossil plan and the enhanced plan, the nuclear plan is in fact about one-third fossil generation. Have I got that right?

If you look at Exhibit 682, page 30 and

33.

A. I'm sorry, the question was?

Q. The nuclear plan is about one-third fossil.

A. The update nuclear plan uses nuclear for base load requirements and fossil for peaking requirements. It's about in the proportions you are talking.

Q. So I am correct, am I?

A. I believe so, in capacity terms, yes.

Q. And you say that the fossil is peaking, I was a little bit confused on that. When you look at page 30 of Exhibit 682, we can see there, if we add up the total generation on page 30, in the nuclear median case, 8,718 megawatts on my addition, and the third up from the bottom, is a CTU CC, which you say is peaking; is that correct? Do you have that in front of you?

A. Yes, I do. Yes, that is peaking.

Q. And then the next unit is a CTU IGCC, and when I look and compare that to the next page, 31, the fossil plan, and the next page, the enhanced plan, I have trouble figuring that to be a peaking plant rather than a base load plant.

Are you telling me that IGCC on page 30,

about four up from the bottom, is a peaking plant?

A. Yes. The CTU/CC and CTU/IGCC in this plan only the combustion turbine unit phases are developed for peaking purposes. They have the flexibility to go beyond that in our proposals, but only the peaking part is developed.

Q. So that in this plan the IGCC is not intended to be carried out within the planning period; is that what you are saying?

A. That is correct.

Q. Does that apply to the other plans on pages 31 and 32?

A. It applies to the ones on page 30. I think if you look at pages 31 and 32, you will see that IGCC is identified as IGCC and not CTU/IGCC, and that intended to indicate that it would be developed as the IGCC.

Q. So in fossil plan on page 31, are those three first IGCCs, 659 megawatts, 1,318 megawatts, and 659 megawatts, are they peaking plants or are they base load plants?

A. They are capable and designed to be suitable for base load.

Q. I am just having a little difficulty with the mathematics as to how that CTU/IGCC is a

peaking plant if all the four first plants on page 31 are base load. Can you help me on that?

THE CHAIRMAN: I think he said designed for base load, but can I infer from that capable of being used for peaking?

MR. SNELSON: All plants have the capability of being used over a range of capacity factors. And so there is some lack of precision in precisely defining whether a plant is a base load plant or an intermediate plant or a peaking plant, and it also depends how they work with the existing system which also can be shifting its role slightly through different plans.

MR. HEINTZMAN: Q. Well, looking at page 30 then much, should we just not show all the CTUs as being CTUs without the prefix IGCC in terms of the planning period?

MR. SNELSON: A. That is how they are developed within the planning period.

Q. I don't see any designated CTU/IGCC on the other two plants, the fossil or the enhanced. Is there any reason for that?

A. I think on the fossil plant you do see some CTU/CCs which would be used for peaking purposes.

Q. We don't see any CTU/IGCCs, is there any reason for that?

A. The IGCCs are being developed to their IGCC potential for use as base load, because the base load fossil, they are being used as base load fossil substantially to replace the base load nuclear of the nuclear plan.

Q. Then at the top on page 30, your second last unit is a CTU/IGCC of 1,344 megawatts. Are you saying that is a peaking unit?

A. Yes.

Q. 1,344 megawatts?

A. It isn't necessarily one unit, but it's 1,344 megawatts of capacity, yes.

Q. That's a huge amount, if it's one plant it's a huge peaking plant?

A. It isn't necessarily one plant. It certainly isn't necessarily one unit.

Q. I said if it was a one unit it is a huge peaking plant?

A. If it were to be one unit, it would to be a very large peaking plant, yes.

Q. Could you look with me at page 33 of this exhibit, 682, and under the fossil column you will see 1.3 gigawatts of CTUs and under the nuclear plan,

2.7 gigawatts of CTUs. Can you explain to me why you would have more CTUs in the nuclear so-called plan than in the fossil plan?

[11:16 a.m.]

MR. DALZIEL: A. One of the reasons for that is the pattern in which the IGCC facility can come into service and that an equivalent amount of capacity is coming in at a more compressed period, three years as opposed to four years.

Q. Which is more compressed?

A. The IGCC facility.

Q. In any event, Mr. Snelson or Mr. Dalziel, when we look at the various charts starting at about page 39 and going through page 50 showing us the so-called update nuclear and showing us, for instance, relatively high SO(2) or NOx or whatever emissions on the so-called nuclear Update, they are a product entirely not of the nuclear element but of the fossil one third element that you have included in the plan?

A. They are product of the plan: the update nuclear plan, the update fossil plan, and on those charts the enhanced plan as well. So those are plan characteristics that are being illustrated there.

Q. But they are a characteristic of the fossil element, not of the nuclear element?

A. In each one of those graphs you are correct. Certain of the characteristics may be more attributed to one option or perhaps even entirely to one option as opposed to another.

Q. The ones I referred to, the SO(2), the NOx, the acid gas, are all attributable to the fossil element that you have kept in the so-called nuclear Update?

A. And the existing system.

Q. And the existing system, of course. But what you haven't put forward is what I will call a high nuclear case where you have either no new fossil or a very limited small proportion of fossil; that's correct, is it?

MR. SNELSON: A. I think the update nuclear case that we put forward uses nuclear for all of the base load requirement, additional base load requirements for which nuclear is suitable.

Q. Yes, but my question was: You have not put forward a case of the six that has all of the new generation as nuclear or a very small proportion of the new generation as fossil; is that not correct?

A. In capacity terms, that is correct.

Q. Yes. Now, let's compare that to the DSP.

First of all, if we could turn to page 15-9 where we look at Case 15, what I am going to suggest to you is that in the DSP there were three cases which ended up being approved for consideration, Case 15, Case 22 and Case 24. You are aware of that, Mr. Snelson?

A. Yes.

Q. And all of those had some degree of nuclear generation, ranging from Case 22 with the highest, to Case 24 at the lowest, and Case -- sorry, Case 22 at the highest; Case 24, medium; Case 15, somewhat lower in terms of the amount of nuclear generation?

A. Can I have that again, I think it was Case 22 with the higher nuclear, Case 15 with the median nuclear, and Case 24 with less.

Q. All right.

A. Yes.

Q. And what you have presented here basically in your nuclear Update is a version of Case 15?

A. I think it is quite similar to Case 15 in the concept of using nuclear for base load and combustion turbine for peak load.

Q. And let's look at page 15-9, and we

see the graph which I will be coming back to you with respect to how Case 15 unfolds from the upper to the median to the lower load forecast.

But in the paragraph on the left-hand side of the page it says:

> Under the median load forecast the base load requirement is supplied by nuclear generation with in-service dates set by cost and environmental considerations. The intermediate requirement is met by existing fossil stations, retrofitted as necessary to meet environmental requirements. The remaining peaking requirement is met by CTUs, convertible to CCs or IGCCs.

So Plan 15 contemplated base load nuclear, peaking through new fossil; correct?

A. It envisaged nuclear for base load and peaking through new fossil combustion turbine units, in some cases convertible to CC or IGCC.

Q. So that is basically identical to what you have provided for in the update nuclear so-called case?

A. As I have said, the update nuclear follows a very similar philosophy to this plan, yes.

Q. Well, it is identical, isn't it?

A. The numbers are different, but the concept is the same.

Q. So all you have done is you have taken the identical concept or plan philosophy and just had the computer readjust the result to present day circumstances?

A. I think there was a little more than just the computer doing it, but in concept, yes.

Q. All right. Now, let's look at Case 23, and that is found on page 15-16. Sorry, this should be -- yes, Case 23, let's do that next, on page 15-16. It tells us:

> In this case more than 85 per cent of new capacity under each load forecast condition consists of purchases and base load nuclear generation.

And then if we drop down three paragraphs, second sentence:

> In-service dates of nuclear units are scheduled to meet all requirements for new capacity, both base load requirements and some intermediate requirements. Existing fossil moves towards the peaking role and no new peaking generation is

required.

See that?

A. Yes, I do.

Q. And when we look on the right-hand side we can see under the low forecast, which is the one to the right, that it is all nuclear except for a CTU in or around the year 2012, something like that?

A. Yes.

Q. And that plan works on the basis that you use existing generation for peaking power and basically all your new generation is nuclear generation?

A. Yes, as described in that paragraph and the figure.

Q. And that plan was put forward so that if someone was concerned about CO(2), greenhouse gases, acid gases, that case would be available for selection as the most aggressive case to meet that kind of environmental consideration; is that fair to say?

A. It was put forward in case that was to be chosen for a balance of reasons, and the reasons you have suggested would be some the favourable reasons for selecting that plan.

Q. Yes. And that case is not one that you have included within the cases that you have put

forward in the Update, is it?

A. That is correct.

Q. Yes. And if it had been included, and we can go through the DSP, it would be a less expensive plan than the nuclear so-called Update plan?

A. No.

Q. You don't think it would have been less expensive?

A. No.

Q. It would have resulted in lesser SO(2), acid gases, NOx, and CO(2)?

A. I would expect so in the period post-2009 when major capacity is required.

Q. It would have resulted in more economic benefits to Ontario if we read the discussion of the DSP?

A. I don't think we have done that specific analysis under the current circumstances.

Q. But the logic contained in the DSP would indicate that?

A. There would be a tendency in that direction because of the high Ontario content of nuclear options.

Q. Right. Then let's look at Plan 22, and that is on page 15-24, I think.

And Case 22 was - we can reflect at page 19-3 - was one of the three approved plans or one of the three plans put forward by Ontario Hydro for approval in the DSP?

A. Ontario Hydro indicated that this was a plan for which it would accept approval, yes.

Q. Yes. And it says on page 15-24: This case is between Case 15 and Case 23; right?

A. That is correct.

Q. So what it is telling us is - and we will read this - is that it contains: more nuclear generation than Case 15 and less than Case 23?

A. Yes.

Q. Right. And if we read the next paragraph:

> Under the median load forecast nuclear units are scheduled to reduce the need for new fossil generation until later in the period. This case requires by 2014 12 CANDU units at three stations, 6 CTU stations, and 16 CTU/IGCC stations;

right?

A. It says "16 CTU/IGCC at two stations".

Q. Yes. Right. And so what this plan

does, it says that all new generation or all generation within the early part of the plan will be nuclear, and it is only later in the plan that fossil peaking will be provided, so that it contemplates the early period, the peaking power being met by existing generation, all new generation being nuclear, and then later in the period using fossil to do some peaking. That is the basic thrust of this plan?

A. That's correct.

Q. Right. And again, this is not a plan which you have taken and adopted in the Update?

A. No.

Q. Am I correct?

A. You are correct.

Q. Well, let's go on to the next case, and that is your fossil case. The fossil case is at page 31 of Exhibit 682, and on page 33 --

THE CHAIRMAN: I wonder if we could take the break. Would that trouble you too much?

MR. HEINTZMAN: It is a good spot.

THE REGISTRAR: Please come to order. This hearing will take a 15-minute recess.

---Recess at 11:30 a.m.

---On resuming at 11:52 p.m.

THE REGISTRAR: Please come to order.

This hearing is again in session. Please be seated.

MR. HEINTZMAN: Q. Mr. Snelson and Mr. Dalziel, we were just about to discuss the fossil case in the Update, and that case contains only fossil generation as we see from page 33 of Exhibit 682 and no nuclear generation at all. That's correct, is it?

MR. SNELSON: A. That's correct.

Q. Now, in the DSP there was one such plan and that was Plan 26, which we will find on page 15-13 of Exhibit 3. Do you recall that?

A. Yes, I recall that. I am just looking up the reference. 15...?

Q. 15-33. It is graphically represented. 15-13.

A. Yes, I have it.

Q. And that case was rejected by the planners in Exhibit 3 and was not put forward as one of the recommended plans; is that not the case?

A. Ontario Hydro did not put it forward as one of the recommended plans.

Q. But you have included it as in effect part of and one of the alternatives in the Update?

A. We have included a plan that is all fossil, but it has a much lesser amount of fossil capacity than was planned.

Q. Well, it has the same amount of fossil capacity as the low case in Case 26. Basically, as we will see, your median case in each scenario because of events is the low case in each of these plans. Isn't that basically the case? I will be coming back to that, but...

In any event, there --

A. It appears to be approximately so in terms of the total capacity by the end of the planning period.

Q. Yes. And if we turn to page 15-70 of the DSP, the disadvantages of Case 26 and the advantages are set forth on page 15-70, and the pronounced disadvantage really relates to meeting CO(2) targets, et cetera, and other disadvantages relating to emissions; correct?

A. There is also a 97 per cent probability of Case 26 being higher cost than Case 15.

Q. Yes. So there was a cost disadvantage, but is it fair to say when you read the DSP that the most materially and certainly the environmental reason why Case 26 was not put forward as a preferred option was due to the acid gas --

I am just reading the second bullet under the heading "Disadvantages": CO(2) targets,

flexibility to meet tighter acid gas regulations or CO(2) regulations, has the lowest Ontario goods and services content, poor balance of trade, vulnerability to approval delays.

You see all of those disadvantages?

A. Yes, I do.

Q. Those are all disadvantages inherent in a total fossil case?

A. Directionally, yes.

Q. Yes. So directionally put, the same disadvantages adhere to the fossil case that you have included in the Update?

A. In terms of higher emissions, and we have shown that in our evidence.

Q. Yes. And also in terms of flexibility, vulnerability to approval delays, lower Canadian content, et cetera? Those are all characteristics of the total fossil case?

A. The vulnerability to approval delays may not apply.

Q. The others do?

A. To the extent that the nuclear option that is chosen is an option with high Ontario content, such as a CANDU option, then I would expect that there would be disadvantages with respect to the Ontario

economic content and the balance of trade.

Q. And the flexibility when you are using only one supply, i.e. fossil alone, the authors of this report say that that reduces flexibility? And that applies as well to Case 26 as it does to the Update fossil.

A. There is more flexibility with a greater range of options.

Q. Yes. But you put forward the Update fossil.

A. We have put it forward as an illustration of how the major supply component might be met.

Q. Now, the DSP had another what I will call fossil alternative, and that is Plan 24 or Case 24, and that is on page 15-20. As we see from the top of page 15-20 of Exhibit 3, this is a case between Case 15 and Case 26. So it has more fossil in it than Case 15 and less than the total fossil case, Case 26?

A. That is correct.

Q. But it does contain nuclear generation?

A. Yes.

[12:00 p.m.]

Q. And this is a case which you could

put forward if you wanted to go to fossil direction but derive some benefits that nuclear generation has in terms of lower cost, emissions, et cetera. That's what the authors of this report tell us?

A. That's correct.

Q. But that's not an alternative which you have put forward in the Update?

A. As I said, the Update puts forward two illustrative cases towards -- not necessarily at the outer bounds, but towards the bounds of the range of major supply options that might be chosen.

Q. We have seen that the outer bounds, if you want to consider that, is Case 22 on the nuclear side, and you didn't put that case forward at all?

A. That is collect.

Q. So what you have done is on the nuclear side you have left off the two plans that are one side of the Case 15; right?

A. We have not included a higher nuclear option than the update nuclear, and that is comparable to Case 15, yes.

Q. You have left off the two cases that are more nuclear than Case 15; right?

A. That is correct.

Q. And you have included on other side

the most fossil of all of the fossil cases to the other side of Case 15; correct?

A. That is correct.

Q. So what you have included is of the three recommended plans in the DSP, you have included one and left out two of the ones that are put forward. Case 24 being the slightly fossil side, Case 22 being the slightly nuclear side and Case 15 being the nuclear based and fossil peaking. Of those three recommended plans in the Update you have only put forward one of those, in effect the Case 15; right?

A. As I have said, these are illustrative and, yes, you are correct, that those are the cases that we put forward, an all fossil plan and a mixed nuclear for base load, fossil for peaking plan.

Q. Just stay with me. Of the three recommended plans of the DSP, in the Update you have only put forward one; right?

A. Where I am having my difficulty here, what we had established is that there are certain philosophies behind the plans and that I have accepted that the update nuclear has a similar philosophy to Case 15 and similar approach to Case 15, and yes, we have put that forward. We have put forward a plan with a similar approach to the all fossil plan which was

Case 26, I think was the number. And we have put forward those two cases as illustrative of a range of ways in which major supply could be met.

We have not put forward plans that have the same philosophical approach as Case 22, which is higher nuclear, or Case 24, which is higher fossil, although you could judge that the higher fossil plan is encompassed between the update nuclear and the update fossil plans that we have used for illustrative purposes.

Q. If I can have an answer to my question.

THE CHAIRMAN: I think that's not a bad answer. I think that is a pretty good answer.

MR. HEINTZMAN: Q. Let me have an answer to this question then. Of the three recommended plans, plan philosophies, if you prefer I use that word.

MR. SNELSON: A. Yes.

Q. You have put forward one of them in the Update, i.e., the plan philosophy in Case 15 and not the plan philosophies in Case 22 and 24?

A. That's correct, as I indicated in my previous answer.

Q. And of one of the rejected plans philosophies in the DSP, namely Case 26, you have

included that in your Update?

A. Yes.

Q. Now, can you explain to me why you have not included the case philosophy in Case 22, so that those who wish to make a choice that greenhouse gases, who wish to make the choice -- if you turn to page 15-71, and if you could look at that page in conjunction with 15-8.

THE CHAIRMAN: I am sorry, 15-?

MR. HEINTZMAN: 15-8 of Exhibit 3.

Q. If you could just have your hand...

15-8 sets forth sort of the basic ideas behind each of the Cases 15, 26, 23, 24 and 22. You see that?

MR. SNELSON: A. Yes, I do.

Q. And basically setting forth that if you are very concerned about greenhouse gases, CO(2), and whatnot, then you are going to go with Case 23; do you see that?

A. Yes.

Q. And if you want to accomplish Case 23 but with not quite so much nuclear then you would go with Case 22, et cetera. Those choices are being made. And the authors at page 71 of Chapter 15 say cases 15, 22 and 24, acceptable. Do you see that?

A. Yes.

Q. And they set out the criteria derived from the DSP and general planning considerations that led them to arrive at a conclusion that Cases 15, 22 and 24 were the acceptable ones?

A. Yes.

Q. Now, can you tell me why you didn't include, as part of the Update, those choices which could then be available for consideration by this Board in terms of what Ontario Hydro was asking for in long-term planning consideration you say that you are interested in?

A. I believe that there has been some discussion as to the meaning of those long-term planning considerations, and the primary thing that I believe has to be addressed, and maybe we are getting into legal territory here, is the alternatives to the approvals requested, and the approvals that we are requesting are with respect to Manitoba Purchase and transmission and the hydraulic approvals.

Q. That's an interesting answer. Are you saying that Plans 15, 22 and 23 are being put forward as alternatives to the Manitoba Purchase?

A. No, that was in 1989. In 1989 we were seeking approval of major supply options, nuclear

and fossil major more supply options, as well as hydraulic and Manitoba Purchase transmission.

Q. I appreciate that. But my question was, why haven't you in the Update, when you put forward future scenarios, included Cases 22 and 24 which are or were considered to be acceptable in the DSP process which took some, I guess, eight years by the time it got to the fall of 1991 acceptable alternatives?

A. Well, in 1989 we felt that we needed to make decisions and we were asking approvals for nuclear and fossil major supply options and so it was important that there be a range of nuclear and fossil major supply options available for consideration.

Under the current circumstances we are not seeking approval for major fossil and nuclear options, and the major supply plans post 2009 are provided for illustrative purposes as a background to the analysis of the rest of the plans. We are not necessarily asking for selection of either the update nuclear or the update fossil. We are indicating that covers a range of possible futures.

Q. Well, it doesn't, as we have seen, span the entire range. You have agreed with me on that.

A. That's correct.

Q. You could have just left off and not had anything in the Update at all about the nuclear and just ignored the future and said, we don't want to talk about major new supply at all, and the report ends there. But in fact you put forward cases which are from a philosophic standpoint, and except for rejigging the numbers, Case 15 and Case 26, and I want to know why in that scenario you did not put forth a planning philosophy that had Case 22 and 24 in it and Case 23?

A. Can I come back to the first part of your question. You said we that could have stopped without going to the stage of major supply plans. I don't believe that that is the way in which would be reasonable to do planning because when seeking approval of facilities or when considering whether or not to build facilities for, say, in-service around the year 2000, then in evaluating that we want to know how the future may play out and how those options may be used over their lifetime, and so we, in planning, simulate the operation of these facilities and their effects on the system for a significant part of their operating period.

Q. So you are saying that in giving consideration to the approvals that are requested, you

are influenced by your long-term view of what the system is going to look like?

A. Yes.

Q. And what the system is going to look like is going to be what you are going to have in your major new supply?

A. That also influences what the system will look like over the long-term, yes.

Q. So it's part and parcel of giving consideration to the approvals that are asked for, you say of the next five years, what the long-term major generation of Ontario Hydro will be?

A. Yes.

Q. I guess that accentuates my question as to why in that event you didn't put forward a Case 23, Case 22 and Case 24 so that the Board would have those choices so it would be aware of the long-term configuration or what Ontario Hydro might look like in the long-term if you say it is important in making those short-term decisions?

A. The specific of that question I think I would like to separate into two parts.

First of all, with respect to a plan that has an amount of fossil generation that's between Case 15 and Case 26 that would be similar in philosophy to

Case 24, and that wasn't done in the illustrative range of major supply options post 2009 because it's essentially unencompassed between the update nuclear and the update fossil plans. And so for judgmental reasons, if you have looked at those two outer extremes then you can judge that this other sort of approach would be somewhere in between.

Q. Can I stop you there or do you want to finish your answer, because I have a question that arises out of that?

a. Let's deal with that.

Q. I suggest to you that Case 24 is fundamentally different than Case 26. If you would like at me at page 15-71, and particularly under the third column on the right under resource smoothing and approval delays which I suggest to you will be very important considerations to us as we debate this matter.

First of all, under resource smoothing under median and upper forecast, Plans 15, 22, 24 acceptably maintain the capability to the design, manufacture and construct nuclear and fossil generation. Under the lower load forecast there is a significant interruption in the nuclear program which would adversely affect maintaining the CANDU options,

and under approval delays, Plan 24 is less vulnerable to the impact of approval delays than the other plans.

So two important characteristics of Plan 24 was that it maintained the CANDU option, i.e., there is CANDU in the plan so you start working on it; (B), it resource smoothes, and (C), it's less vulnerable to delays in approvals. That's what the authors were telling us.

A. For the specifics of those plans as evaluated at that time, yes.

Q. Well, the same would be true today, that if you put forward a Case 24 against a Case 26, it would have those criteria that are reflected by the authors here in the difference between Case 24 and Case 26?

A. To a degree, yes.

Q. So I suggest to you that not putting forth a Case 24 is not just a case of leaving out the intermediary case, it's leaving out the key ingredients of an approved plan that Ontario Hydro thought was worthy of approval.

A. We thought that was worthy of approval in 1989 when we were seeking approval of major supply options.

As I have indicated, the major supply

options at the moment from 2009 on are illustrative. We are not seeking approval of them.

Q. Well, sir, I have asked you now I guess four times why you didn't include Plans 15, 22 and 24 in the Update.

A. I have told you why we didn't include Plan 24.

Q. So you told us all the reasons?

THE CHAIRMAN: He hasn't told you yet about Plan 22. He hasn't got to that yet.

MR. HEINTZMAN: Sorry.

Q. You told us all about Plan 24?

MR. SNELSON: A. That's correct.

Q. Tell us about Plan 22.

A. I believe that Ontario Hydro - and I indicated this in my direct evidence - has had a distinct shift in its stated preference of nuclear for base load options.

Q. Well, that may very well be, but it's up to this Board to examine that philosophy; isn't it?

A. That is correct.

Q. And it's not a question of Ontario Hydro prejudging that; is it?

A. Ontario Hydro is putting forward the plans that it considers to be reasonable given the

current circumstances.

Q. But the whole idea, I understood, of this process was you put forward certainly what you think are the preferences, but you put forward the alternative methods and the alternatives; right?

MR. B. CAMPBELL: Mr. Chairman --

THE CHAIRMAN: Just a moment. Why can't he answer that question?

MR. B. CAMPBELL: I am quite prepared to say he has put forward, he has already said he put forward the alternatives. But I take my friend's question as being aimed at what the obligations of the proponent are.

THE CHAIRMAN: Let's put it this way. If the proponent is required to put forward the alternatives, why wouldn't you put this alternative forward? That question can be answered.

MR. SNELSON: We have put forward alternatives in different ways. We have talked about alternative options, we have described them in terms of their environmental impacts, their levelized unit energy costs, a variety of characteristics of the options. It's a smaller group of -- way of selecting the options and putting them together into plans that we have put forward. And as we have indicated, the

update nuclear is one of the plans that indicates the effect of adding nuclear as an option.

MR. HEINTZMAN: Q. Well, if you want to put forward all of the options -- let me just understand this. Are you saying that the philosophies in Cases 22 and 23 are now outside the bounds of Ontario Hydro's acceptable philosophies from a planning standpoint?

MR. SNELSON: A. Well, we haven't specifically had to make a decision on that because we don't need to make the decisions for post 2009 at this point in time, so you make the decisions when you need to make them. But there has been a significant shift in corporate thinking, in the corporate position with regard to the attractiveness of nuclear and fossil as base load options.

Q. All right. So you have told you don't have to make the decisions, so I would therefore assume that Cases 22 and 23 aren't yet outside the philosophic bounds of Ontario Hydro from a planning stand point; would I be correct?

A. As I say, we haven't had to make that decision, but I believe if we had to make that decision, then it is less likely that they would be acceptable today.

Q. But it's not definitive; is it?

A. It is definitive to the degree that the update fossil and the update nuclear plans were the plans that were put to the board of directors in the same way that the previous plans were put to the board of directors but, as I say, now under new circumstances and they were the plans that were accepted by our board of directors.

Q. That's quite an answer. That says then this the board of directors has made a choice to that extent.

A. To the extent that they accepted plans showing that those illustrations of how future major supply options may be met.

Q. I think you have told us then that the higher nuclear case, of Case 22, wasn't put to the board?

A. It was not put to the board and rejected, but if they wanted to see a case like that they could have asked for it.

Q. Let me understand that answer. Was such a case developed to put to the board or to be available to be put to the board? You have told us I think through Mr. Mark no.

A. That's correct.

Q. And Case 23 I take the same answer applies, no?

A. That is correct.

[12:20 p.m.]

Q. And your answer tells us, I assume, that that was done because you knew what the Board wanted to see?

MR. SHALABY: A. Mr. Heintzman, if I may interject for a minute, if nothing else to give Mr. Snelson a break... [Laughter]

Q. I would just as soon talk to you for a moment, too, Mr. Shalaby.

A. We have a deal if anybody goes for more than 20 minutes the other will cut in.

I think you are asking, what will the shape of the Ontario electricity system be if we adopt a philosophy similar to 23, 22 or 24, and I am convinced that the documents that we have presented, Exhibit 3, Exhibit 6, and all the others, contain that intelligence, contain that information.

You correctly observed that the requirements under median today are similar to requirements under lower for the DSP, 1989.

If one wants to understand what would the future look like under an all nuclear scenario you can

go to Plan 23 under lower load forecast and look at emissions and look at costs and look at Ontario content.

Now, there are modifications, there are changes that have occurred, so you directionally can adjust those results in your mind.

For example, if you look at cost differential, Mr. Snelson has said that the cost advantage of nuclear over fossil has narrowed, so you can look at the cost differential and decide that it is not as favourable or is more favourable or adjust it mentally to get the information you want.

The point I am making is that we don't need to redo everything to understand the implications of it. The foundation is here, the work that we have done, we can continue to draw on it, and to conclude what needs further doing and what needs just referring back to.

Q. Right.

A. So that is the answer I would like to put on the record.

Q. You have put the nail on the head, Mr. Shalaby, because what you are really saying is, we don't need the Update to make the fundamental choices that are already set out in the DSP between the

philosophy in Case 22, 23, 15, 24 and 26.

A. We can with the information that we have prepared before make considerable judgments and answer considerable questions as to what the future would look like if we went this way or the other way.

Q. Yes, as long as we have got the up-to-date information and as long as we have got those philosophic choices before us we can make those choices. That is what you are saying; right?

A. I am even saying more than that. I am saying without having an Update you can look at lower cases--

Q. Yes.

A. --take in the updates that were given on costs and advantages and so on, and that you would be very close to understanding what the future would look like if you went all nuclear.

Q. Well, that is going to be a large part of my cross-examination, that you can take Case 15, and indeed it is a much better tool than the Update, and you can apply it to the present circumstances and make your judgment, can't you.

A. Well, let's wait for your cross-examination.

Q. That is what you are telling us,

isn't it.

A. I am saying that for the cases we haven't analyzed that would be a very good proxy.

If we have made an Update, an analysis, perhaps that would be even better than going on old information. If I didn't make an Update, yes, I am prepared to go on Plan 15 and answer a lot of your questions.

Q. What you are telling us by your interjection is that we can take Plan 15, which is on the lower case almost identical to the Update, and make our choices based upon the different philosophies presented?

A. Draw a lot of conclusions.

Q. Yes.

A. If you want to call that making choices, that is fine.

Q. But we can't do it if someone tries to take those choices off the table, can we.

A. Maybe you can explain to me what choices you are talking about.

Q. If someone says those choices are no longer available, one of them let's say or two of them, then you can't make that choice, can you?

A. I think Mr. Snelson went over and

over that we are not making a choice, period. So the menu is on the table --

Q. You just interjected to say that you can make those choices.

A. We can make judgments and we can explain to you what the environment would look like, we can explain to you what costs would be like, we can use the older information to make an awful lot of judgments about what the situation will be if we analyze a case like that or if we decided to go that route.

Q. So as long as we have the up-to-date information and the philosophic choices before us we can make the same choice or the same choice process as the Update makes, can't we, as long as we have got the up-to-date information? Do you see any reason we can't?

A. I am trying to review your question in my mind again. Can you say it again?

Q. Well, you interjected to say, look, we have got all this information, we can make the choice; right?

A. We can provide an understanding, we can answer questions about what happens if we went to all nuclear, what happens if we went part this, part that.

Q. Yes.

A. If you call that making choices for the purpose of this discussion, that is fine. I don't see choices in providing an understanding. But if you see choices in that, that is fine.

Q. So you are agreeing with me? As long as we have the philosophic cases there, we have the up-to-date information, we can perform the same exercise without the Update; right?

A. We will try and help you with that, yes.

Q. Now, let's take the second point that arises from your interjection, Mr. Shalaby. The second point that arises from your objection is that you can actually compare the Update --

A. I wasn't objecting. I was trying to be helpful. Don't characterize my --

Q. No, your interjection, which has been extremely helpful. [Laughter]

The second thing we can do, and we will get to --

THE CHAIRMAN: You are going to spoil his lunch if you keep that up. [Laughter]

MR. HEINTZMAN: Well, I need somebody to spend 20 minutes with.

Q. The second thing we can do is we can compare, to the extent that it is different, the Update to Case 15, can't we?

MR. SHALABY: A. No, those comparisons are not straightforward. I think what I am --

Q. We can do it, can't we?

A. What I am saying, to recap again, is that we have updated certain information and that is the quality information that is higher in resolution than the older information, but where we have not updated we can look at the older information and get an awful lot of the philosophy or direction.

Q. Right.

A. So what I am saying is, when we have an Update, that is reliable and that is the information we should be looking at. When we don't have an Update what I am saying is we don't have a void; we have Exhibit 3 to look at, and that gives us a large number of answers.

Q. Yes?

A. But I would not propose that we ignore the Update and look at Plan 15. That simply would not serve the purpose of the Update.

Q. Let's not ignore it for a moment. Let's compare it. One of the things we can do is we

can compare the Update to Plan 15, can't we.

A. There are a lot of things that have changed that make that direct comparison difficult.

Now, there are comparisons in philosophy that are easy to make, there are comparisons in general direction that are possible to make, but, for example, if you want to compare present cost or present value cost or things after that nature... So many things have changed that make that direct comparison less meaningful.

Q. But we can do it, making the appropriate adjustments to Case 15, and then compare that to the Update Exhibit 452, can't we.

A. There are many, many attributes that we looked at: cost, performance in the various environmental areas.

Now, it depends. What is it you want to compare? Let's narrow it down. What is it you want to compare and see if it is reasonable or not.

Q. We have got ingredients in the Update, and I was going to come to this later in the examination, but you have raised...

There is more demand management in the Update than in Plan 15; right?

A. Yes.

Q. There is more NUGs in the Update than in Plan 15?

A. Yes.

Q. There is life extensions in the Update and they are not in Plan 15?

A. Yes.

Q. There is no new generation in the Update and there is new generation in Plan 15?

A. There is new generation in both of them. There are different sets of approvals requested, if that is what you are --

Q. Well, all right. Those are differences between those two cases?

A. That is correct.

Q. You can compare those two cases?

A. We can identify those differences, yes.

Q. And then we can compare them, the criteria?

A. With limitations. I don't want to get into a prolonged debate other than to say there are things that are more easy to compare, there are other things that are more difficult to compare.

Q. But that is the plan again, that is the assessment process, isn't it?

A. Yes.

Q. Now, there is nothing in the Update, there is not one page in the Update that compares this plan with Case 15, is there?

A. Not to my knowledge.

Q. Or with Case 22?

A. Not to my knowledge.

Q. Or to Case 23.

A. Same answer.

Q. Yes.

A. That was not the purpose of the Update, is to compare to the older generation of plans.

It was to provide our board of directors and provide this Board of Inquiry with the latest views that Ontario Hydro has about meeting our customer demands into the future according to all the criteria that we mentioned.

Q. But some may find it deficient because it doesn't do the very thing it is required to do; that is, compare an alternative way of accomplishing what is in Exhibit 452. This document just doesn't contain that, does it.

A. It contains three plans, as all my colleagues and myself introduced in this panel. It contains comparisons that we feel are more appropriate

today than the cases that we formulated three or four years ago.

Q. I am going to come back to this. The things that it compares are things that it is not asking this Board to consider; right?

A. It provides a context in which to consider the approvals that we are requesting.

Q. No, the three things that it compares - the nuclear case, the fossil case and the enhanced case - you are not asking for approvals on?

A. That's correct.

Q. So the three things that it does compare you are not asking this Board to consider; right?

A. We are not asking approvals on.

Q. Yes. And the things that it doesn't compare - the Manitoba Purchase, the fossil extensions, those sort of things - it doesn't compare it to anything, does it - this document, 452?

A. If you are saying we have not formulated plans that do not have Manitoba or plans that do not have life extensions--

Q. Yes.

A. --in that document, you are correct.

Q. Yes. And even as to the NUG and DM

components of this 452, it doesn't compare those to the pre-existing NUG and DM plans, does it, and say: Which is better?

A. It doesn't show plans that have fewer NUGs and fewer demand management, but I think you can draw the conclusion as to which is better.

Q. Well, this document doesn't compare the old NUG to the new NUG, the old DM to the new DM plan, does it.

A. This document does not, but it indicates that the demand management and the NUGs are below avoided cost, and we know from what we told this Inquiry and what we have worked on for years that if you have an option that is cheaper than another option that is a better way to go.

So you don't need to do the mechanics and the numbers to know it is a better option. You know it is lower than avoided cost; that is the way you should go.

Q. Well, it may be that you are right, but this document doesn't analyze the environmental, the social, the cost, and all the other criteria of the old demand management plan to the new demand management plan, does it.

A. The answer is: Yes, it does not.

Q. Thank you.

A. And the subtitles are: We didn't think it was useful or necessary to do that, to compare a plan with larger demand management to a plan with smaller demand management.

We know directionally that the more demand management we can get below avoided cost the more consistent that will be with our priority strategic directions and for that reason we selected that plan.

MR. SNELSON: A. And Exhibit 452 does reinforce those priority strategic directions. They are explicitly included in Exhibit 452.

Q. Well, this is a point I was going to come to much later in my examination. That is, you have set up a priority, Mr. Snelson. And I guess Mr. Shalaby's 20 minutes was up so we will come back to you. You set up a system of priorities for demand management and NUGs; right?

A. Effectively, yes.

Q. Yes. So in every one of these plans we are going to go through you don't compare meeting the electricity requirements of Ontario citizens by virtue of demand management to some other method or alternative, do you, because you have made it a

priority?

A. In our plans we have not done so, but we have in terms of our general consideration of the options.

Q. Well, in the plan, in this document, Exhibit 3, or in Exhibit 452, you don't set out to analyze and establish the criteria and go through the societal, economic, environmental, and all the other things that we know and love so well of the demand management way of meeting the requirements of Ontario citizens as opposed to doing it in some other way, do you. You have just set it as a priority.

A. We have described the environmental and social implications of the demand management and non-utility generation options in documents such as Exhibit 4.

Q. So I want an answer to the question. If you turn to page A2 --

THE CHAIRMAN: They didn't do it in Exhibit 3 either.

MR. HEINTZMAN: Exactly. Exactly.

THE CHAIRMAN: So I mean, I took it this was a different, you were focussing on the difference between the Update and Exhibit 3 and it wasn't done in Exhibit 3 either.

MR. HEINTZMAN: Q. On this point we have the same attribute.

MR. SHALABY: A. Mr. Heintzman, there is a generation of plans that precedes even Exhibit 3, Mr. Chairman, and that is the illustrative plans we analyzed in the mid-to-late-80s, and those are provided to this Board as exhibits that looked at, for example, an all supply case versus an all demand case.

And those cases are documented here, and those showed us that a mix of supply and demand was a more desirable mix to go through.

So I am saying that 452 builds on Exhibit 3; Exhibit 3 builds on what went before it. We don't make it a habit to repeat everything from day one every time our data changes. We learn and retain that knowledge and build on it.

Q. Let's understand what exactly went on in your planning process.

If you turn to Exhibit 3, Appendix A, A-1, paragraphs 2 and 3 say that Ontario Hydro is giving priority to demand management in paragraph 2 and non-utility generation in paragraph 3; right?

MR. SNELSON: A. Yes.

Q. So that in every one of the plans that we examine in Exhibit 3 and in Exhibit 452 they

all have at the top, coming off the top, demand management and NUGs; right?

A. That is correct. And these priorities are based upon the Demand/Supply Planning strategy, which as Mr. Shalaby has said included analysis of plans with different mixes and was based on a very extensive public consultation, consultation with Select Committees of the government, where these sorts of priority directions were confirmed.

Q. Right. Well, what happened? If you go back, and I think you have told us this but just to reflect on it, what happened was that prior to 1989 you had in process a planning approach that considered whether you should have demand management, NUGs and all sorts of ingredients in the plan, and that was the sort of philosophy at that time, but starting with this document in March of 1989 the DSPS said: No, from now on we are going to put at the top of the list demand management and NUGs. That is the historical way this unfolded?

A. Certainly, the priority for demand management and NUGs was enunciated in the Demand/Supply Planning Strategy in 1989, and, as I have said, that was based on a lot of planning studies and a lot of consultation activities with public and with the

Legislature.

Q. But before that - and we can go back and look at some of the exhibits if we have to - the approach that Hydro was developing was: No, these various programs have to be considered on their own merit, one against the other, and we will determine on their merits which one should be adopted and to what extent; that's correct?

A. I'm not sure, before when.

Q. Before March of 1989.

A. Yes?

Q. And then in March of 1989 you adopted a different planning philosophy where you said: From here on in demand management and non-utility generation are on a different plane; they are prioritized. Right?

MR. SHALABY: A. Provided that they are implemented in ways that are acceptable, at costs that are competitive, and many other conditions. It is not as dogmatic as you make it sound.

Q. Okay. But they were prioritized to that extent?

A. Yes.

Q. Right. And they from there on were not compared to other alternative means of meeting the electricity requirements of the citizens of Ontario?

A. No, they continually get compared in what we describe as closing the loop. Closing the loop means is the component that is demand management or the component that is non-utility generation still leading to a low cost plan, is it still a lower component in cost than other options. We compare it to avoided costs all the time, and it meets that test.

Q. Well, it meets the test of avoided cost --

A. And we look at environmental considerations, and it continues to meet the environmental advantages that in the first place resulted in those priorities.

So it isn't that it found itself on a different track and forever stayed on that track without any reference to other options --

Q. Well, when I look at the plans they come right off the top.

[12:40 p.m.]

The first thing that comes off is demand management and the next thing that comes off is non-utility generation.

A. Yes.

Q. But then at the end we check whether that was an appropriate thing to do.

Q. All right. But in the going-through process you don't at any point compare demand management and non-utility generation with another way of accomplishing the same result; namely, meeting the electricity requirements of Ontario citizens; do you?

MR. SNELSON: A. The plans all have in the demand management and non-utility generation, but that's only one sort of comparison that we do.

We have discussed through nine panels the detailed characteristics of individual options, well, the individual options were against panels 4 through 9. And those discussions have been in terms of the merits of the options. We have talked about the environmental characteristics of demand management, we have talked about the costs, we have talked about the social impacts and so on. And that's true of much of the documentation.

So there are comparisons of demand management and non-utility generation on a variety of factors.

Q. Well, Mr. Snelson, I have read Exhibit 3 and I have listened to a great deal of testimony, I can't find any place where you say, here is the amount of demand management and now let's look at satisfying that electrical requirement by fossil

generation or nuclear generation.

Can you point to me somewhere where you make that comparison?

MS. HOWES: A. I think I can.

Q. All right.

A. If you refer to Exhibit 4.

Q. I don't have Exhibit 4 here.

A. 4-1. The right-hand column of that page, the second full paragraph down that begins that "Environmental characteristics of demand management", and I will refer to the last sentence in that paragraph:

> Preliminary of estimate of these effects - which is referring to demand side management - indicate that they are negligible when compared to the effects of producing the displaced power through conventional generation.

And I would agree that in - was it - Panel 4, the demand management panel, there was a discussion of the environmental implications of demand side management against fossil.

Q. But I agree that there is a discussion of the environmental effects of demand management, but the demand management component there

being spoken of is a constant in every one of the cases put forward; is that not correct?

MR. SHALABY: A. There were discussions of environmental effects if demand management was not there. We provided as exhibits to this hearing what the environmental implications would be if you pulled out the demand management component and replaced it with supply. That report is on the table and we are looking for it here.

Q. But in every one of the cases put forward to the Board, whether it's in Exhibit 3 or Exhibit 452, the demand management is a constant element?

A. Yes. And the reason for that is, we were not trying to be putting a random sort of selection of plans, we were putting plans that we feel are targeting our priorities strategic directions, are consistent with them, because we know that is the direction we want to go through.

If we put a plan without demand management we know at the end of the day we will reject it. Why take people through a long course of description and work and then at the end we know fully that that plan will not fare as well. We know that. The costs will be higher, the environmental impacts

will be higher, the social acceptance and acceptability in the Ontario community would be lower, why bother formulating a plan like that and presenting it.

Q. We will get to the why bother later, Mr. Shalaby, but in fact no such plan has been put forward to this Board?

A. It's been put forward in the 1986, '87, '88 documents. We have done that when we have wondered whether it is or is not a good idea, and once we are convinced it's a good idea we will build on it.

Q. So from 1989 forward and before this Board Hydro has not put forward a case or plan which we can compare to where you either eliminate or diminish demand management so we can have a comparison of those two methods?

A. The answer is we have on the record plans that do not have demand management.

Q. Prior to 1989?

A. Yes, prior to 1989.

Q. But those plans are not here before this Board for approval?

A. They are before this Board for information and for providing the sort of the basis on which we built our strategy and the basis on which we decided demand management is a priority. They are

before this Board. I don't see why you keep saying that.

MR. SNELSON: A. And Mr. Shalaby did indicate that in Panel 4 we put forward plans without demand management post '89.

Q. Well, there is no such plan contained in Exhibit 3 or Exhibit 452. You will agree with that.

A. That's correct. They are two of the large number of exhibits in front of this Board.

Q. And there is no such plan proposing an alternative method of that nature, i.e., eliminating or are reducing NUGs in either Exhibit 452 or Exhibit 3; correct?

A. That is correct.

Q. Now, I want to turn then to the enhanced case under the Update, which you will find on page 32 and 33 of Exhibit 682. As I understand this case, it was primarily designed to reduce SO(2), CO(2), NOx and acid gases. Is that a fair statement to whomever should respond?

MS. HOWES: A. It also looked at wastes as well and it looked at some options for supply that were not nuclear or fossil.

Q. Yes, all right. But do I understand from the evidence that the primary thrust of it,

though, was to -- and I would assume the primary cost element in the enhanced case is to address SO(2), CO(2), NOx and acid gas considerations?

A. I cannot refer to the costs because my expertise is environmental, but from an environmental point of view I was looking, or we were considering, a range of environmental effects, emissions were one, wastes were another, options for supply were a third.

Q. Can you give me any idea on a cost basis what percentage of the enhanced case is attributable to dealing with those gases I am referring to?

MR. DALZIEL: A. The costs of the enhanced case are described in Exhibit 646 under attachment C, the very last page of that attachment is C3-12.

Q. Yes?

A. You were asking about costs of emission controls?

Q. Yes.

A. The second category is emission controls and other costs for existing generation.

Q. Right. I would just like to get an idea of what percentage of that amount of 4,668,000,000

in 1992 dollars, is that the number we are looking at?

A. It's a present value cost 1992 dollars, yes.

Q. What percentage of that is directed towards the kind of emissions I have been referring to?

I assumed from the description I read in the transcript that it was the overwhelming proportion of the cost of that plan in terms of the environmental assessment aspects of it.

A. I don't have the details of what percentage was attributed to SO(2), NOx, the acid gases. Are those the ones that you are mentioning?

Some of those emission controls were for different ways of reducing particulate, for example.

Q. Particulates from fossil stations?

A. Yes. They also included costs for MISA at all stations.

Q. And again applicable to fossil stations?

A. And nuclear stations.

Q. That was my question. What amount of that $4.7 billion is attributable to fossil stations as opposed to nuclear stations?

A. I don't have that information with me.

Q. Can you find that out for me?

A. I can look into it.

MR. HEINTZMAN: Thank you.

Could I have an undertaking for that, Mr. Chairman?

THE REGISTRAR: 684.16.

---UNDERTAKING NO. 684.16: Ontario Hydro undertakes to provide amount of $4.7 billion is attributable to fossil stations as opposed to nuclear stations, page 32 and 33 of Exhibit 682.

MR. HEINTZMAN: Q. I understood from the transcript and the references at Volume 149, page 26325, and I don't think you have to look it up, Ms. Howes, but I think you said at that point that to the extent that it contained nuclear upgrades, if I can use that word, those were already under way as I understood your evidence. You may want to look at page 26325.

MS. HOWES: A. Yes, I think the point that I was making, some of those upgrades are under way at one station, and we assumed for this particular case that all of those upgrades would occur at all of those stations and there was some costs incurred for those updates to be -I'm going to use the word - "installed" at all of the stations.

Q. Again the impression from what you said, that this - if I can use the word - upgrade is

already part of Ontario Hydro's --

A. It may be under way at one station, it is not intended at this time to be under way at all stations.

For the enhanced plan we assumed that the upgrades would be done at all stations.

Q. So that in the number you are going to give to me, you will exclude from the nuclear enhancement any enhancements that are already in your operating --

A. Absolutely.

Q. Okay. Now, this case, this enhanced case, and Ms. Howes, can you give me even an idea as to whether -- that the largest portion of the emission controls, et cetera, of this $4.7 billion would be related to fossil stations and not to nuclear stations; would that be a fair statement?

A. Wouldn't you rather wait until we had the results of the undertaking? I think that's what the --

Q. You have no idea now?

A. At that point I don't know what the percentage difference between the fossil and nuclear would be at this point.

Q. But you have rhymed for us in the

evidence all of the components of it. And except for that reference to the nuclear on that one page, all of the rest of it, as I understood it, related to fossil?

A. There were MISA upgrades as Mr. Dalziel mentioned, and there were -- I forget what the other ones were at this point. But subject to confirmation from the undertaking that Mr. Dalziel has, I can agree that, yes, likely many of those costs were for the fossil system.

Q. That the largest proportion of it would be for the fossil system?

A. Could I say large at this point subject to the clarification from Mr. Dalziel's undertaking?

Q. Yes.

A. Fine.

Q. What I am suggesting to you, though, and again whoever who should answer this, the enhanced case is based on a fossil case?

A. Much of the base load for the enhanced plan is IGCC. The fuel for the fuel cells is indeed natural gas, the fuel for the biomass plantations is wood, wood waste.

Q. Well, if we look at page 33 of Exhibit 682, under the enhanced column, except for the

fuel cells and biomass which I will come to, all of the other generation is fossil generation and none of it is nuclear?

A. That is correct.

Q. So that if you were intending to design an enhanced case and if you were intending to apply it in order to reduce SO(2) and NOx and acid gas and everything, I have a great deal of difficulty understanding why you wouldn't apply the enhanced case to a nuclear-based case rather than to a fossil-based case?

A. I think my evidence suggests that the enhanced plan has better performance from SO(2) and a NOx perspective.

Q. Than?

A. The update nuclear case.

Q. Exactly. But if you had taken the enhanced case and applied it to a nuclear-based case; in other words, what you did, if you look on page 33, you applied the enhanced case to the fossil case which is in the middle of the case. If you had taken the enhanced case and applied it to the nuclear case on the left-hand column side, all of these charts for the enhanced case, SO(2), NOx, whatnot, would have been dramatically lower than these charts show for the

enhanced case?

A. They could probably have been for those emissions. They may well have been considerably higher for other wastes or emissions.

Q. But if, as I understood, the thrust of your evidence, and you went on at a great lengths about all of the additions of the enhanced case to the fossil plants, if the thrust of it is to reduce those acid gases and air emissions, you will agree with me that your enhanced case is going to be a much more enhanced case if it's a nuclear-enhanced case than a fossil-enhanced case?

A. I am not sure I can make that judgment without having looked at all of the emissions and wastes that we considered in that particular plan.

It is true that this is an illustrious -- illustrious, maybe it is -- an illustrative case, and there could be others.

Q. But when you have got two cases on the page on the left-hand side and your object is to fairly present what an enhanced case will look like in terms of SO(2), NOx, et cetera, why did you not run an enhanced nuclear case? Can you explain that to me.

A. We probably could have run an enhanced with a nuclear base. But I am suggesting that

in my direct evidence we got considerably better performance from the enhanced case from the emissions that you were describing in the earlier period before 2010.

Q. But you didn't look at what you would get if you ran an enhanced nuclear case; did you?

MR. DALZIEL: A. An enhanced case applied to a nuclear case up to the year 2010 would in all probability would be much the same as what is shown here. After that period there definitely would be some differences.

And building on what Mr. Shalaby has said about Exhibit 3, we can take some of the information that we provided here and directionally you can make judgments as to where certain emissions are going to go.

Q. Well, I have a difficulty with that, because the enhanced case involves applying all of these devices to not only the existing system, but to new generation; right?

MS. HOWES: A. No. The new generation, the IGCC we assumed an SCR, it would not require scrubbers and the other technologies that we assumed.

Q. Well, it assumes application of the enhancement to the total plan including the existing

plan, right? I don't know whether your enhancements are on the new fossil generation, but they are certainly on the existing.

A. That's true. And I stated that we assume state-of-the-art for the CTU combined-cycle, and we have assume that the IGCC in the enhanced plan would have SCR for better NOx control.

MR. DALZIEL: A. And some of the new generation would have common requirements with respect to MISA, for example.

[1:00 p.m.]

Q. Yes, but if you look, for instance, at page 43 of Exhibit 682 I would assume you got the update enhanced NOx emissions, say, in 1999. If you apply the enhancement to a nuclear system your NOx index is going to be at least as low as the update enhanced.

MR. B. CAMPBELL: Mr. Heintzman, I'm sorry, I don't understand the question. There is no new generation in the cases until about 2009, 2010. What do you mean when you say if you apply in 1999 enhancements to the nuclear system? I just don't understand. We don't have new generation coming in. I don't understand what you are talking about.

MR. HEINTZMAN: Q. Well, you are

applying the enhancements to three systems that are set forth on the bottom of the page. The one on the left is the update nuclear, the next is the update fossil, and those lines are considerably higher than the line of update enhanced; right?

MS. HOWES: A. Yes.

Q. If you had run a case and if you build your system with an enhanced nuclear case and an enhanced nuclear system, the NOx emissions will be at least as low as what you have shown for the update enhanced?

MR. B. CAMPBELL: In what period are you talking, please, because the question just doesn't make any sense unless you put some time on it.

THE CHAIRMAN: You have got another line I assume with another symbol showing Update nuclear enhanced, and that line would at least be -- since Mr. Heintzman has suggested to these witnesses, that line would at least be as low as the current update enhanced, starting back in '92 and going forward from there.

MR. B. CAMPBELL: If you put all the same things that are in the current update enhanced on the existing --

THE CHAIRMAN: The problem with me is I

don't know how you create an update nuclear enhanced, but I suggest we will find out about that later on.

MR. B. CAMPBELL: I am trying to get my friend to clarify what he is talking about because I don't understand when we are dealing with the existing system and emissions from the existing system what he is talking about. If he is talking about --

THE CHAIRMAN: Someone has plotted a line there, Mr. Campbell.

MR. HEINTZMAN: Yes.

THE CHAIRMAN: Someone has plotted a line that shows what the update enhanced will do, and it shows it will reduce the NOx emissions considerably from '92 through to the year 2000.

MR. B. CAMPBELL: Absolutely. And as I understand the question, it is asking what would happen if you applied something to some other case.

DR. CONNELL: Isn't it going back to 646, page C3-12? Isn't it spending that four billion, six hundred and sixty-eight thousand dollars on emissions controls and other costs for existing generation? Isn't that what Mr. Heintzman is getting at?

MS. HOWES: Existing generation, you mean existing nuclear generation?

MR. HEINTZMAN: No, on the existing

system as it --

THE CHAIRMAN: Fossil.

MR. HEINTZMAN: Q. On page 43 you have plotted three systems as they go out into the future; right?

MS. HOWES: A. Right.

Q. One is a system which has nuclear and some fossil for peaking; right? One is a case that has entire fossil. One is a case which has entire fossil with enhancements as stated by you.

Now, my suggestion to you, if you apply the same enhancements, the same requirements for enhancements to the nuclear generation stations to the extent they are there, to the fossil stations to the extent they are there, that the NOx index line is going to be at least at low as the line for the Update enhanced? Is that not obvious?

MR. DALZIEL: A. I think I said earlier, I answered that "yes". I said that in all likelihood they would be exactly the same. It wouldn't just be the NOx index. It would be all the indices up to that point in time.

Q. All right. So that --

THE CHAIRMAN: Can we go to lunch now?

MR. HEINTZMAN: We certainly can.

THE REGISTRAR: Please come to order. This hearing will adjourn until 2:30.

---Luncheon recess at 1:05 p.m.

---On resuming at 2:37 p.m.

THE REGISTRAR: Please come to order. This hearing is again in session. Please be seated.

THE CHAIRMAN: Before we start I have been asked to record yet another exhibit, No. 690, filed by the proponent, Ontario Hydro, entitled: Clarification Material on Exhibit 520.102 [Interrogatory 9.2.44], Regarding the Pickering Payback Cost Details.

I have said before, when we end this hearing we will probably speak in nothing but numbers.

---EXHIBIT NO. 690: Filed by the proponent, Ontario Hydro, entitled: Clarification Material on Exhibit 520.102 [Interrogatory 9.2.44], Regarding the Pickering Payback Cost Details.

THE CHAIRMAN: Mr. Heintzman?

MR. HEINTZMAN: Thank you, Mr. Chairman.

Q. Ms. Howes, Mr. Shalaby and Mr. Snelson, I guess the three of us were talking about page 43 of Exhibit 682 which tracks the NOx being emitted by a generating system, being either the update nuclear so-called update fossil or update enhanced, and I think you had agreed, Ms. Howes, that if the system

is an enhanced nuclear system that the emissions will be at least as low as the line there shown for the update enhanced?

MS. HOWES: A. Yes. I think Mr. Dalziel answered that for me.

Q. Thank you, Mr. Dalziel.

If we turn to page 47 we have a situation where we are tracking emissions, and again, now, we have the update nuclear so-called line below, and would you agree with me that the update enhanced nuclear case, if it had been run, would have a line at least as low as the update nuclear line?

A. Beyond the year 2010? Yes.

Q. I'm sorry?

A. Yes.

Q. And in any of the years--

A. Preceding?

Q. --shown there?

MR. SHALABY: A. Did you mean update enhanced?

Q. Update enhanced, if it was on a nuclear base, yes. You are agreeing with me?

A. I think you said at least as low as update nuclear. I thought you meant at least as low as update enhanced.

Q. No, at least as low as update nuclear.

A. Oh.

Q. The update nuclear line is now lower than either the update fossil or the update enhanced, and I am suggesting to you that now we have a situation which I am trying to demonstrate you are getting the best of both worlds here; you are getting now, I suggest, at least as low particulate emissions as the update nuclear line; right?

MS. HOWES: A. Right. Could we just clarify again what we are talking about? What are you phrasing this? You are phrasing this as: update enhanced nuclear?

Q. Yes.

A. And that would be...? If could you just clarify what exactly that --

Q. Go back to page 33?

A. Yes? It's long time since the break. Yes?

Q. Taking the plan on the left-hand side--

A. Yes.

Q. --the so-called nuclear plan--

A. Yes.

Q. --and applying to it the environmental enhancements where they would be applied--

A. Yes?

Q. --that are inherent in your enhanced plan on the right, which you have told me, and we can see, only has fossil units for the new units and, of course, we are going to apply them to the existing system as well, and most particularly to the existing system.

DR. CONNELL: Sorry, Mr. Heintzman. I believe you have misrepresented the figure on page 47. As I read it, up until 2009 the nuclear is not the lowest line. After 2009 it appears to be the lowest line.

MR. HEINTZMAN: Yes, exactly.

DR. CONNELL: Before 2009 it tracks the fossil line.

MR. HEINTZMAN: Q. Yes. So I guess I was -- you are absolutely right. I was focussing on the end of the chart.

So from the year 2010 to 2017 the particulate emission would be -- if we had an update nuclear-enhanced case, it would be at least as low as the update nuclear case therein shown after 2010?

MS. HOWES: A. It probably would be in that range, but there would probably still be some particulates associated with the alternative technologies that are in there. That is why I wanted to go back to 33 to find out exactly what you were meaning by your case.

Q. That is a good point. So you are saying if we put the fuel cells and the biomass into the nuclear case and keep the nuclear to 6.0 -- and readjust the nuclear? I was assuming that, I must say.

A. Right.

THE CHAIRMAN: I think you can only perhaps deal with this in very general terms--

MS. HOWES: I agree.

THE CHAIRMAN: --because if you enhance the nuclear plan adopting the same general principles that you adopted in enhancing the fossil plan, you wouldn't -- or will you? You wouldn't do it in quite the same way?

MS. HOWES: No, probably not.

THE CHAIRMAN: But you could enhance -- in general terms, there is no reason why you couldn't enhance the nuclear plan as you did the fossil plan?

MS. HOWES: That's correct.

THE CHAIRMAN: No bar to that?

MS. HOWES: No.

MR. HEINTZMAN: Q. And that is exactly what I am trying to get at.

Generally speaking, and I appreciate that there will be refinements, but if we look at page 47 that we would expect the update nuclear plan enhanced to have particulate emissions after 2010 which are generally speaking tracking the update nuclear line there?

MS. HOWES: A. Generally speaking, yes.

Q. And similarly, and just looking at it before 2010, you will agree with me that before 2010 we should expect again with an update nuclear enhanced plan for the particulate emissions to track the update enhanced because we are getting the enhancement on the particulate emissions?

A. Generally speaking, yes.

Q. And the same would be true if we turn to page 49 for the CO(2)? Generally speaking, since we are either out to about 2010 reducing CO(2) emissions through enhanced environmental controls on the fossil and after about 2010 we have lower emissions because of nuclear that we are going to track generally speaking the update enhanced line and then the nuclear line?

A. I would say beyond 2010 it probably

would be somewhere between the update enhanced and the update nuclear line there. There was the addition of fuel cells, if you remember, in this case. So it would be somewhere between those two lines on the graph.

I think the other key thing to remember, too, in the enhanced plan is there is slightly more demand management and NUGs, so you would have to take that account into your adjustment of these lines.

Q. Well, now, I want to then turn to that, what you have just mentioned, and try to create a level playing field, if I can, between the nuclear enhanced plan and the other plans.

Now, first of all we have already noted that the enhanced plan has about 8.6 gigawatts of fossil instead of a comparable amount of 8.7 of nuclear. So if that is the one difference between the two plans, if we had an enhanced nuclear as to enhanced fossil, we are going to have that much less fossil generation in the plan, approximately?

THE CHAIRMAN: You are looking at page 33?

MR. HEINTZMAN: Q. Page 33. And we are going to have to make some adjustment for what you put in the fuel cells and biomass, but there is going to be in the order of eight to nine less gigawatts of fossil

generation and that much more of nuclear generation?

The amount is not that important. There is going to be some amount of fossil generation removed and some amount of nuclear generation inserted?

MS. HOWES: A. That's right. That's right.

Q. And if you just reflect back, Ms. Howes and Mr. Snelson, on my discussion with you on the absence of Plans 22 and 23 from this analysis, I suggest to you what we are seeing here is a potentially compounding effect. That is, if you put before us a Plan 22 or 23, which has enhanced nuclear, over what you have on the left-hand side of page 33 and you then enhance it with the various environmental controls that Ms. Howes has told us about, then we should expect a compounding of the reduction of CO(2), NOx, acid gases and those sort of things? Would you agree with that?

A. Generally, you would get lower SO(2), lower CO(2), and lower NOx. You would probably get higher radioactive waste and higher radionuclides.

Q. Yes. Right. Now, let's just go back to the difference between the enhanced plan and the nuclear and fossil plans, and you just commented on it, Ms. Howes; that is, that the enhanced plan assumes no reduction in demand management or NUGs, as I understand

it.

A. The surplus in the enhanced plan is managed by mothballing fossil stations, and in the other plans the surplus is managed by deferring some NUGs.

Q. Right. So I am correct, am I, that in the enhanced plan there is no assumed reduction or management of demand management and NUGs?

A. That's correct.

Q. Right. And that automatically makes the enhanced plan more expensive because -- and I think you say it in your evidence, that it is about 10 to 15 per cent extra cost in the enhanced plan just because you are maintaining a higher level of demand management and NUGs?

MR. DALZIEL: A. I don't know that we said it was 10 to 15 per cent more. It might work out to be that. But we showed that not managing the surplus is more costly. We showed that on page 71 of Exhibit 682.

Q. Yes. Yes. Sorry, five to 10. If you could look at page -- in Volume 149, at page 26384.

THE CHAIRMAN: Can you give me the page number again, please?

MR. HEINTZMAN: 26384, Mr. Chairman, and

there are three pages actually, 26371 and 26369, if you want to make a reference of that, where this point is dealt with.

Q. 26384, 26371 and 26379 are all commenting on the fact that the extra DM and NUGs is going to add some cost to these plans.

On page 26371, was that you, Ms. Howes, that is talking at that time, you say:

> In present value terms there are higher costs as a result of not reducing demand management, the hydraulic, and the purchase NUGs?

[2:50 p.m.]

MS. HOWES: A. Net present value words would never be uttered from this mouth. Someone down at that end. [Laughter]

Q. Someone told us that.

MR. B. CAMPBELL: Mr. Dalziel, I believe.

MR. DALZIEL: Which page, 26371?

MR. HEINTZMAN: Q. Yes. At about line 13.

MR. DALZIEL: A. Yes, that's correct.

Q. And on page 26384.

A. Yes. At this point Dr. Long is talking.

Q. And the figure of 5- to 10 per cent being added to the rates due to the increased targets of demand management an NUGs are referred to there.

DR. LONG: A. Sorry, which page is that on, 26384?

Q. Yes.

A. And here we are talking about the enhanced plan?

Q. I understood it to be, but...

A. In the second paragraph there I talk about rates being higher in the late 90s and the early 2000s by up to 10 per cent, but the reason cited is the additional environmental controls and not demand management.

Q. I see. I am looking at the bottom the two lines, three lines. Increased targets for demand management and non-utility generation program which have added between 5 and 10 per cent to the rate outlook.

A. There I am talking about the change in the overall long-term rate outlook between the time of the original Demand/Supply Plan and the Update. And that generally applies to all three cases, update nuclear, update fossil and enhanced.

Q. All right. Would it be fair that the

enhanced plan has extra costs in it because you have left the full amount of demand management and NUGs in them; is that a fair statement, Mr. Dalziel?

MR. DALZIEL: A. It turns out to be a higher cost approach, yes.

Q. Yes. Just focussing on those two elements, because of that?

A. It's a combination of maintaining the demand management levels and the purchase non-utility generation levels. Mothballing existing plant overall turns out to be more costly than managing the surplus by the other illustrative approach in the update nuclear, update fossil causes where the purchase NUGs and the demand management were reduced by varying degrees over the surplus period and existing generation was not mothballed.

Q. But if we want to get an exact apples for apples comparison, I take it you can run the enhanced plan and put in exactly the same amount of DM, the same amount of non-utility generation, mothball the same plant so that we can see exactly on a facility per facility basis what the cost of one is as against the cost of the other.

MR. SNELSON: A. It's clearly possible to run additional cases, but I think we are getting

pretty close to a discussion of running cases for intervenors and so on that was the subject of correspondence among counsel prior to this panel.

Q. Mr. Snelson, I am not asking to you run the case. I am just suggesting to you, if you ran the case, having told me that there is extra DM and NUGs in the enhanced case and they are most expensive and if you run the case on enhanced and put them exactly the same conformity in the nuclear, the fossil and the enhanced case, the cost of this enhanced case is going to come down?

A. I think we have agreed with that proposal.

Q. Now then, the next thing that the enhanced plan assumes is the supplementary energy is taken under the Manitoba Purchase, which is not assumed under the nuclear and fossil columns; correct?

A. Yes, that's correct.

Q. So again, if you eliminate it and the same playing field as between the two or the three cases, again the enhanced plan could come down in cost?

A. I am not so sure of that.

Q. Well, is it true, is it not, that taking the surplus energy, according to the documents that I have read, costs you?

A. Sometimes it will cost you and sometimes it will not.

Q. I understood from the documents that the enhanced plan was more expensive because the surplus energy was being taken.

A. My problem here is that the surplus energy was not -- sorry, the supplementary energy of the Manitoba contract was cut out for the whole of the period I believe up to 2010 in the update nuclear and update fossil plans. I think that a more accurate and lower cost assumption would have been to have cut it out for some part of that period but not all of that period.

Q. Well, whichever you do, that energy costs you, as I understood your evidence, more than other available energy sources in your system when it's being taken?

A. When there is coal-fired energy being produced on the system, then I believe that the supplementary energy generally saves money rather than costing money.

It's only if the total energy demand of the system is being supplied by nuclear and hydraulic, that taking the supplementary energy actually costs you money.

Q. Well, I am going to have to come back to that because I understood from the documentation that the reason supplementary energy wasn't being taken in the fossil and nuclear plans was because it was expensive to take and therefore a decision was made in those plans not to take it.

A. It was a broad assumption in those plans on which with more refinement a better assumption could perhaps be made.

Q. And then the final element is the fuel cells and biomass in the enhanced plan, and again those are quite expensive elements of that system.

MR. DALZIEL: A. They are higher cost than some of the conventional, if you want to call it that, options, such as the IGCC and the CANDU and the combustion turbine units.

Q. The LUECs go up to, from 6 to 21, I think in the case of fuel cells, and 9 to 19 cents per kilowatthour in the case of the biomass, if I have got my notes correct.

Do you want to have look at page, I think it's B-7 in Exhibit 646.

Do you have that page, B-7, levelized costs?

A. Yes. It's indicating a range in the

LUEC values for those two options, the biomass and the fuel cells.

Q. 6 to 21 cents for biomass and 9 to 19 cents for fuel cells per kilowatthour 1991 dollars?

A. Yes.

Q. So that adding those two elements in to the enhanced plan, no matter how meritorious it is, adds substantial cost on a comparative basis to the nuclear and the fossil alternatives?

A. It adds to the cost.

Q. So that when you run the cost figures on page 71, cost alternatives --

THE CHAIRMAN: 71 of what?

MR. HEINTZMAN: Page 71 of Exhibit 682.

Q. To demonstrate the difference in costs between the enhanced plan and the other plans, there are a whole series of elements in it that are more expensive than are in the nuclear or the fossil cases.

MR. DALZIEL: A. Generally, yes.

Q. Most particularly, I suggest to you if you took out -- if you base the enhanced case first of all on a nuclear case, and then you took out all of the elements that differ from the nuclear and the fossil, to make them as comparable unit by unit, as in

the three plans, the only difference being these enhancements that you have discussed on the existing system or the new nuclear fossil generation, then the difference between the cases would be substantially different and lesser, is that not apparent?

A. Well, generally the costs we would expect them to come down, but the degree to which they would come down would depend on your definition, now getting back to the definition of the enhanced nuclear case. And I sense that you are changing more of the features in the enhanced case and therefore you are moving further away from the philosophy of that case.

If you want to have compare the costs, I could suggest two tables where we could do that, and I could give a sense of where I think the costs would change between the two cases.

Q. Well, the enhanced case I am talking about is page 33, with the nuclear case as it presently exists by putting on the environmental controls on to any elements of the CANDU or CTU generating we see there, and/or, if necessary, the existing system. That's what I am talking about, the enhanced case.

A. For example, would you take the fuel cells out of the enhanced nuclear case?

Q. For this comparison, yes. The fuel

cells and the biomass out, and then just enhance the nuclear case.

A. Then I'm not sure that it is enhanced in the same extent or the same philosophy as the other case. But certainly if you took those other options out then, yes, the costs would come down.

Q. And I suggest to you that the enhanced case will get very close to the nuclear or the fossil case if you do that, or do we not have sufficient --

A. How do you mean by very close?

Q. I can't make that estimation but I guess neither can you, unless you can point me to something that assists us.

A. Generally speaking, the way I would have approached this is to say that in the enhanced case, just as a first step, what if we remove the IGCC as the base load option and put in the CANDU 6 as the base load option, and then if we were to leave all the other components and all the other enhancements to the case the same way, then I would expect the cost difference between the enhanced case as we have presented it, and the enhanced case which I have just suggested, would be the same cost difference, the order of the same cost difference between the update nuclear

and the update fossil, and that's about $260 million present value.

Now, if you take out some of the other more -- you want to change the enhanced case further by taking out the biomass facilities and the fuel cells, then the cost difference between the two would increase, it would be more than $260, and I could only take a guess at that -- I don't know, I wouldn't know what it is.

Q. So that we bring the difference down, if we compare it on the basis that you describe, down to $260 million difference; is that what you are saying?

A. Yes.

MR. SNELSON: A. That was a difference, as I heard it, between the enhanced fossil case and the enhanced nuclear case.

Q. Is that what you are saying, or the --

MR. DALZIEL: A. The difference between the enhanced case as we have presented it, that's with the IGCCs and the combined cycle facility, the biomass and the fuel cells, if we instead of the IGCC, we are preserving much of the philosophy of that case, but instead of using base load fossil IGCC facilities, we

put in CANDU 6 units, then I would expect the cost differences would be very similar to the cost difference between the update nuclear and the update fossil, and that cost difference was $260 million.

Q. And if we make the other changes that we have discussed, you can't tell us now what that will do?

A. Well, the cost different would increase, but the degree to which it would increase I couldn't tell you offhand.

Q. Okay. I want to turn to another subject and that is the whole timing relationship between where we are under the DSP plans and where we were when the DSP was written.

I think it was maybe you, Mr. Dalziel, or Mr. Shalaby, who was discussing with Mr. Mark at Volume 150, that in terms of the difference between the need dates under the upper and the median, it was then about eight years and it is still about eight years.

Do you recall that discussion?

MR. SHALABY: A. Yes, I recall that.

Q. So that in that respect there has been no change in the difference between the need dates under those two scenarios; right?

A. Generally they are separated by

roughly the same number of years.

Q. So that if the original update was based on the thought that they were smaller or larger, that would be incorrect. Basically they are still about the same.

MR. DALZIEL: A. I think we made a distinction between the need date for major supply and the need date for base load major supply. The need date for major supply generally under the 1989 plan was around the year 1993/94 under upper load forecast, but that the first base load station was coming into service in the year 2002. And then under median load forecast in the 1989 plan, the need date was around the year 2000/2001, so that's where there is that about seven year difference, and the first base load station was coming into service in 2003.

So the need date as to when you might first be installing CTUs as a major supply facility, has the seven or eight-year difference. But the difference between the timing at which the first base load station would come into operation was one year.

Q. You are talking under Plan 15, are you?

A. That's correct.

Q. But under Plan 15, as Mr. Mark

pointed out to you, you provided for an earlier installation of an IGCC to look after that. We can look at it if you want to.

A. The earlier installation of CTUs, which at some point in time in the future they never were converted in the Plan 15, but had the possibility of being converted to combined-cycle and IGCC operation, but as installed in the plan and as modelled in the plan they operated as a peaking facility.

Q. But the system was adjusted to look after base load in the early years through the existing fossil and nuclear under Plan 15, and you adjust it, and Mr. Mark went over this with you, I don't want to repeat this, that the need date is about the same between median and lower -- sorry, median and higher, under the present situation as it was under Plan 15.

MR. SHALABY: A. The only point Mr. Dalziel is adding is that he wants to make the distinction between need date, period, and need date for base load facilities. That is a second consideration that he wants to bring to your attention, that's all.

Q. The need date for upper and median load growth, the difference between those two in the DSP and now is about the same. We are agreed on that

at least.

A. We accepted that, yes.

Q. And the so-called need date for base load is only the date upon which the plan provides for the addition of a unit.

MR. DALZIEL: A. And I think what you are getting at is that if in the year 1997 you could have put in a base load station in Plan 15, would you have, the answer is we may well have.

Q. Yes. And the reason it was in 2002 or 2003 was because that's the time you needed to get the nuclear station going.

A. Yes.

Q. And so you provided the IGCC or CTU before that?

A. That's correct.

Q. Right. So it wasn't a question of -- if you look at page 15-10 and 5-19, and Mr. Mark went over this with you and I didn't intend to repeat the analysis. You can see there that there is an additional CTU or IGCC generation under the upper case in the years 1993, 1994, and 1997, 2000 and 2001, all of which is there because you take until 2002 to get your planning and installation of the first nuclear station.

[3:10 p.m.]

A. Yes.

Q. Right.

MR. SNELSON: A. So not all of it is there for that reason. Some of it is there for that reason.

Q. These plans work on need dates, don't they, and the need dates haven't changed. All this page shows you is some changing in the dates of nuclear generation construction based upon the fact you can't get it constructed any sooner.

A. It is constrained by the construction lead time.

Q. It is constrained by the construction?

A. Yes.

Q. And that is what this plans tells us, that that is as soon as we can get nuclear constructed, is...2002, I think it says; right?

A. That is correct. That was the situation in 1989.

Q. So that the date of the construction of the plant on this page doesn't tell us anything about the need date. That is just the date that you can get the facility erected and you are building in

the meantime CTU and IGCC, or whatever, to look after base, intermediate and peaking load with your existing system and those new facilities?

A. That is correct.

Q. Right. So can I then take it that insofar as need dates nothing really has changed?

A. The need dates are further back in time.

Q. All right. The need dates are further back in time, but the time between - and it is the second point I wanted to make - is really no different looking at it from 1994 forward than it was looking at it from 1989 forward.

The first construction of nuclear under Plan 15 was 2002, from 1989 which is some 13, and 2003 which is some 13 years away, and in 1994 the time horizon to your planned new construction of nuclear generation is in the same order of magnitude.

A. The in-service date of nuclear in the Update Plan is 1999, and by my arithmetic that would be 15 years after 1994.

Q. Yes. And that is under a median date?

A. Did I say "2009"?

MS. HOWES: A. No, you said 1999.

Q. It is just a Freudian slip, Mr. Snelson.

MR. SNELSON: A. The in-service date of nuclear in the Update Plan, I believe, is late 2009.

Q. Yes?

A. And that is 15 years after 1994.

Q. Right. And in the median case under the DSP standing in 1989 it was 2003, which is 14 years?

A. That is correct.

Q. So we are basically in the same parameter in terms of the need date under a median forecast that the writers of this plan were in 1989 if a decision from this Board comes out in 1994?

A. Well, we were not anticipating a decision from this Board in 1989, so I don't see the comparability between 1989 and 1994.

Q. But wasn't this plan based upon a 1989 framework working forward 25 years?

A. Yes.

Q. So if we apply the same framework, because of the slippage of hearing time and the slippage of demand we are in basically the same relationship as we were looking forward from 1989; isn't that fair?

A. We are hopefully more than halfway through this hearing process, so I believe that we are probably further along now than we were in '89.

Q. Oh, yes, I know. But in terms of somebody looking with 1989 field glasses on, they are looking forward to major new construction of nuclear under this plan in approximately the same time horizon somebody will be looking forward to 1994 with their 1994 field glasses on looking forward to your new construction date of 2009; right?

A. Yes. If you push this date forward to '94, then it is 15 years as opposed to 14 years. But I don't see the comparability.

Q. Well, I suggest to you that we are in really the same sort of situation in 1994 as we were in 1989, and I have gone through two of the criteria with you.

Let's look at the third, and that is the kind of demand that you are looking at. If you will turn with me to page 29 of Exhibit 682 and if you look with me, at the same time keeping that page open, looking at page 15-9 of the DSP, Exhibit 3. The median line, which we see on page 29 of Exhibit 682, is very much the same kind of line but somewhat steeper -- no, just about the same steepness as we see under the low

forecast on Case 15, and indeed all these cases. They basically work on the same low growth generation with different components.

But you see it was going up from zero on page 29 in 2010 to about, it looks like 7.5 to 8 gigawatts in 2017, so that is seven years, and on page 15-9 we are going up from zero or just above the Manitoba Purchase to just under 10, so about the same order of magnitude of generation required under the low load growth in Case 15 as there is under the median forecast on page 29?

A. Yes. That increases, if you ignore the Manitoba Purchase part, it appears to be from about 2007 to 2014, compared 2010 to 2017.

Q. So exactly seven years in each case?

A. A different seven years, but seven years.

Q. Yes, seven years, and the growth going up about somewhere between seven and eight. It looks almost exactly the same amount of generation in each case?

A. Approximately, it is the same order of magnitude, yes.

Q. Which is the point that we covered this morning, that basically the low load forecast in

1989 has forecasted very accurately what is now the median forecast?

A. This is for new major supply requirements, which is the result of balancing a lot of different components, and I think that fortuitously, that has been the end result, yes.

Q. Well, the components are found under this line, under the slanting line, but the slanting line is the same slanting line in each case. That is the demand, the need line, isn't it?

A. Well, that need line is the line that I say is the result of a number of balancing components as a result of the changes in basic load forecast, changes in the demand management plan, changes in the non-utility generation plan, changes in the hydraulic plan.

Q. Right. So what we see is that Plan 15 very accurately prognosticated, although it said it would be in the low load growth situation, which I guess it has turned out to be - to date - what exactly we have now in your median forecast.

A. Well, this is the major supply component of Plan 15.

And remember that Plan 15 was a Demand/Supply Plan that included demand management,

non-utility generation. So we are only looking at one part of that plan.

But in terms of the major supply requirement, the major supply requirement of Plan 15 under low load growth is quite similar to the major supply requirement currently envisaged under median load growth.

Q. Yes. So what I am saying to you is on all the relevant criteria Plan 15 envisaged the very circumstances that you are forecasting under the Update?

A. No, I don't believe so.

Q. Well, in terms of the difference between your upper and your median need date, in terms of the amount of generation and the period in which it is needed, in terms of the time horizon, all of the things that the DSP was addressing?

A. I think when we are planning and we are planning to a range of load growths above and below the median load forecast it is the range that matters, and the fact that the low end of the range of major supply requirements happens to coincide now with the median estimate of major supply requirements to my point of view emphasizes how much things have changed.

Clearly, there was a band here, and this

was a low end, and that low end of that band has now become the middle of the new band, and that is a large enough change to affect the way in which plans are drawn up and considered.

Q. I am not suggesting that the demand hasn't fallen. That appears to be the case. And it may go back up again, might it not?

A. That's correct.

Q. And that is the whole object of having a flexible plan such as Plan 15, is that it expressly allows for that movement, doesn't it.

A. We try to ensure flexibility in all our plans, yes.

Q. I mean, there is no point in having a low load forecast situation and to have a generation plan that beats that and then say, well, when that transpires that, well, we have got to throw it out the window, is there? I mean, that is what you have it there for, isn't it?

A. It is there to show the effect that if we plan on the median and that we work along those bases and then things change to be the lower, but as soon as you accept that the lower is your new median then -- and if you have flexibility to do so you should change your plans because you now have to envisage the

fact that there may be an even lower circumstance that is the lower end of the range.

Q. Yes, and there may be an even higher one which would be the higher range?

A. The probability of having an even higher one is reduced because you have lowered the range.

MR. DALZIEL: A. Just to add to that, what Mr. Snelson is referring to was shown in that same Exhibit 682, at page 82, where if you want to compare the range in major supply requirements you have shown --

Q. Sorry, what page are you looking at?

A. Page 82 in Exhibit 682.

The major supply requirements under median load forecast are the same as the ones we have been looking at at page 29, but in this case there is no requirement for major supply under lower load forecast. That is the point that Mr. Snelson was just making as well.

Q. I'm sorry, I am not following you.

A. I am just mentioning that we have shown what the range of major supply requirements are under today's circumstances and that the requirements according to median load forecast now correspond to

what the requirements for major supply were in 1989 under lower load forecast. That is one part of the picture.

The other part of the picture is that today there is no requirement for new major supply under lower load forecast.

Q. That may well be, but is it not demonstrably correct that the Plan 15 envisaged the circumstance that is now transpiring under the low load growth scenario?

MR. SNELSON: A. In this respect the current median expectation is within the range and towards the low end of the range on what was envisaged in '89.

Q. Yes. And I suggest to you that if Plan 15 is before this Board and is considered acceptable, then it forms a flexible basis for doing exactly what is now transpiring, i.e. planning to what will happen in 2009, 2010, or additional or lesser supply, because the plan has envisaged the circumstance that we now presently have; is that not fair?

A. We have talked about this being a balance between a variety of things, and I am not sure when you say Plan 15 whether you mean the major supply component of Plan 15 or Plan 15 in its totality,

because the totality of Plan 15 includes the demand management and non-utility generation, the hydraulic, the Manitoba Purchase, all of the other aspects of the Demand/Supply Plan.

Q. Yes. And it has envisaged and taken account of the circumstance which we now have before us insofar as it may be now the median and was then thought to be the lower; isn't that fair?

A. And I have indicated that the change of expectation of what was previously thought to be the lower now being considered to be the median is very significant in planning and is the sort of significant change that has driven the changes that are in the Update.

Q. And that is the kind of change you would expect over time?

A. I think that we do see changes like that over that time. I think we have seen a rather larger than normal change over the last three years.

Q. And did we not see those changes in the early 1980s where demand fell off very substantially and then accelerated through the 1980s such as we had never seen it before?

A. There was low load growth in 1981/82 during a recession, and load growth picked up quite

rapidly beyond that.

Q. To the highest levels we have ever seen in Ontario in the 1980s?

A. I indicated that in my direct evidence, yes.

Q. Yes. So the same thing could happen again?

A. It could happen again.

Q. Now, the difference, I suggest to you, between what we now have on page 29 and what we had before - page 29 was 682 - is that, as you pointed out, this is now the median.

If you look with me at page 30 where we have -- so, being the median, this now has something like a 60 per cent probability of occurring rather than a 20 per cent possibility of occurring when it was the low load forecast, major supply program? Would I be in the right ballparks on those numbers?

A. When we have to divide the future up into three sets of circumstances and say this is like median, this is like upper, this is like lower, we tend to use those sorts of weightings.

Q. Yes.

A. The load forecasters tell us the probability of it being exactly as they forecast the

median is zero, but...

Q. All right. Well, I see in Exhibit 6 the median is 26 per cent, but in any event, I understood you to be using for median purposes 60 per cent, upper 20, lower 20.

A. When we have to divide the future into three categories we use those -- and in those three categories we use those weightings, yes.

Q. So that the probability, if I can use it that way - and I am not hanging you on this percentage - of page 29 and page 30 happening now is in the order of 60 per cent instead of as it was, 20 per cent?

A. Something closer to the median than to upper or lower we would associate as having a 60 per cent probability.

Q. Okay. And so the cost of this plan being wrong or costing more than it should, the ramifications of that are now much more severe than they were when it was only a 20 per cent possibility?

A. There is a higher weight put on evaluating what would be the median, yes.

Q. Yes.

A. And so in any cost evaluation there will be more weight put on this scenario than there

would have been when it was the lower.

Q. Right. And it is an order of three to one from the statistics I see in Exhibit 6, and Mr. Mark took you through some of those, that your median probability being 60 per cent and your low or high load growth forecast being 20 per cent, that the costing allocation is three times as much on the median cost? [3:30 p.m.]

A. In this way of describing probabilities, yes.

Q. Now, let's look at this plan on page 30. I think Mr. Rodger pointed out to you that you are contemplating installing something like 12 or 13 units in seven years, nine of which are nuclear stations.

A. Yes.

Q. Now, sir, what would occur to Ontario Hydro if those seven years were very adverse in terms of economic conditions, very high interest rates, very adverse years for construction? Would that have an economic harm to Ontario Hydro if it had compressed into seven years that kind of generation?

A. Costs might be higher than they would otherwise be.

Q. Costs could be very substantially higher than they would otherwise be by compressing into

7-1/2 years this tremendous generation program; isn't that fair to say?

A. If these were bad years for construction costs would be higher. This is the sort of rate of installation of capacity that we have experienced before.

Q. I suggest to you that under the median forecast in the prior plans, the generating capacity construction is spread out over 12 or 13 years; isn't that fair to say?

A. It's spread out to match the need for generation, yes.

Q. Yes. But you can adjust your other programs to make sure that you generate, you develop your generation over a longer period of time.

A. You could do that.

Q. Yes. And that's one of the directives of the DSPS, is it not, resource smoothing?

A. Resource smoothing, yes.

Q. So the whole planning philosophy in the DSP is carried into the plans that are there contained which spread out, particularly at the median, the construction of generation capacity; that's fair, isn't it?

A. The construction of generating

capacity in the median is spread out because the need for generation is spread out in the median.

Q. Yes. And you can adjust that by holding back on your DSM program or on your NUG program, or any of your other elements to make sure that your basic base load construction is done over a number of years to obviate the economic disaster that can occur if you built all of it in seven years?

A. You could slow down your demand management and NUG programs and end up with the generation program, major supply program spread out over more years, that would be contrary to the main thrusts of the strategy in terms of giving preference to demand management and non-utility generation to delay the need for major supply as much as possible.

Q. And the demand management and NUG program is not so dependent on huge capital costs for expenditures of construction of the nature that we see in the program set forth on page 30 of 682; is it?

A. That's one of its advantages.

Q. That's one of its advantages.

So you have really constructed a scenario here that pushes all of this construction into a very narrow time horizon because of your dedication to demand management and NUGs and the other elements of

your program?

A. That is one of the effects of giving priority to demand management non-utility generation.

Q. And the other thing that, the other aspect of this that is important, I would suggest to you, is that --

MR. SHALABY: A. I want to add that what you see there, the seven year period, it has a Biblical sound to it, but the seven year where you are get all these nuclear units, the construction period is much longer. Construction of these plans starts years in advance of that. So you are not doing everything within seven years. Construction and definition and engineering work takes five, six, seven, eight years ahead of that, and commissioning and training and other things take a few years after that.

So the window in which these units sort of hit the construction market and engineering market is much wider than the seven years you are talking about.

Q. But they are marching along, they are starting earlier than 1990, but they are marching along together from whenever out to 2015, this huge construction program?

A. Yes. But all I am saying is you have

to hit a period of bad luck that is much longer than seven years to get the effect that you are talking about.

Q. But if you have adverse economic circumstances through those years you are going to have much more harm to Ontario Hydro and Ontario citizens that if you spread out your construction of your base load in major supply program; fair?

A. They are spread longer than seven, perhaps 10 or 12 or more. If you spread them even more than 10 or 12, you are quite right, you reduce your exposure to a period of high economic uncertainty.

But all I am saying is a 10 or 12-year period of construction is less likely to be all bad than perhaps the six or seven that you are talking.

Q. Well, you are taking me right to the next point I was going to make, Mr. Shalaby. I was wondering if you could turn to page 15-9 to explore this point. Because the DSP at each of the cases which it set forth had an express system for moving from one load growth scenario, one construction scenario, to the next; didn't it?

MR. SNELSON: A. I am not quite sure what you mean by that.

Q. Well, the whole idea of the system

that we see configured in figure 15-9 is that you have a certain generating philosophy, you gear that up so that by getting your approval up front you can then move forward as need be into the definition stage, and you can then bring on the units, either in the upper load growth which we see in the first part of the chart, the median load growth, or the lower load growth; right?

A. Yes.

Q. So it was a whole systematic approach to planning premised on getting your approval upfront, getting yourself ready to move forward in case upper load growth occurred, and being progressively planning and designing towards the need date as it occurred from time to time; right?

A. Yes.

Q. Right. So that when and if you come to the lower load growth, which we see on figure 15-9, although it's a steep line, it's not what I will call a shock to the system because you have already got your approval, you have already done your definition phase to the extent that you need to. In fact, you were ready for this back in about the year 2002 to go with your first CANDU "A"; right?

A. No.

Q. Why not?

A. I think our assumption under low load growth in the 1989 Demand/Supply Plan was that any approvals that we had obtained in the 1990s would have to be redone because of the long delay between the time of acquiring the approvals and the time when the approvals would be actually used.

Q. I'm sorry, you say the DSP contemplated getting new approvals?

A. Yes.

Q. And can you show me anywhere in the DSP, Exhibit 3, where that's stated?

A. It probably is in Exhibit 6 but I am not sure that I could find it without spending a fair amount of your time.

The assumptions were that the costs of acquiring approvals in the 1990s would be a cost that would not be utilized in the low load growth case.

Q. Well, I'm sorry, I thought that the whole system here was designed to meet all of the three load growth scenarios.

Could you turn with me to the DSP to page 15-4. Now, down the left-hand side of the page it says -- well, starting with the bandwidth forecast heading:

Each case was tested against the bandwidth forecast consisting of five electricity demand paths.

And the five included the low load growth forecast, did it not, Mr. Snelson?

A. That's correct.

Q. And continuing down the next paragraph:

These five paths test the ability of each case to accommodate changes in forecast electricity demand. If the load rises more quickly than the median, then additional generation is added if possible. If load grows slower than the median new generation is deferred or existing generation is mothballed. Cases were rejected which were designed primarily to meet the upper forecast. Such cases would have enough generation to meet all criteria as economically as possible under the upper forecast but would be overbuilt and have excessive costs under the median or lower. Cases designed primarily to meet the median forecast were also rejected...

And that's instructional in light of your present Update,

> ...because they would not include the early preparatory work that provides the flexibility to meet the upper forecast. Cases designed primarily to meet the lower forecast were rejected because under the median or upper load forecasts these cases would have poor reliability, et cetera.

So the cases were designed to meet all of the plans, all of the load forecasts. And if you read each of the cases starting on page 15-8, they each say that they are going to be advanced or delayed as necessary.

Would you turn to the Executive Summary, page X, Roman numeral X, paragraph 8, second sentence.

> Because of the difficulty in accurately forecasting demand over such a long period, the plan will permit all demand to be met which falls between the range between the upper and lower forecasts.

And page XV, paragraph 33:

> Timely approvals are requested to

permit the upper load forecast to be met. The actual commitments to build facilities will be made on the basis of actual load growth experience. The approvals to meet the upper load forecast are required so that Ontario Hydro will have the flexibility to adjust if load growth is higher than the median forecast.

THE CHAIRMAN: We are coming to a question fairly soon, I hope.

MR. HEINTZMAN: Q. Let's look at page 18-1.

MR. SNELSON: A. 18-1, we are now out of Roman numerals?

Q. No, it's chapter 18, action plans. The very bottom of the page, 18-1:

> As stated in the demand/supply planning strategy, the preparations for the options definition phase will be taken in time to meet the upper load projections while avoiding the cost of premature commitments. If the actual load trend is below the upper forecast, the project commitments will be delayed

to just-in-time requirements.

Now, am I not reading this as telling us, and I can read other parts, that this plan provides for and requests approvals that will cover the upper, the median and the low load forecast?

A. Plan 15 did request approvals that were early enough to allow the upper load forecast to be met with major supply options. And as you have indicated, the strategy was to delay the actual implementation of those approvals if the load was recognized as being less than the upper load forecast.

The point I was making about the lower load forecast is that I believe that in the cost analysis of the 1989 Demand/Supply Plan, because there was such a long gap between obtaining approvals and using them, then it was assumed that those costs were essentially absorbed and that the approval process was restarted for a later in-service date.

Q. Well, I must say I have never seen that, if you would like to point that out to us. It's not in the DSP.

A. I can't just sit here and flip through.

THE CHAIRMAN: Perhaps we could take the break and maybe when we come back from the break he

will have that. We will break for 15 minutes.

THE REGISTRAR: Please come to order. This hearing will recess for 15 minutes.

---Recess at 3:50 p.m.

---On resuming at 4:09 p.m.

THE REGISTRAR: Please come to order. This hearing is again in session. Be seated, please,

MR. SNELSON: Mr. Chairman, if I could perhaps -- sorry.

THE CHAIRMAN: Mr. Campbell wants to exercise his prerogative.

MR. B. CAMPBELL: I have very few prerogatives and almost none with respect to my witnesses, so I will take full advantage of the opportunity, Mr. Chairman.

Mr. Chairman, I would just like to again for those who are trying to -- sometimes after the hearing it is hard. People take off, and this is the last day of the week, and people are reading the transcript for next week.

I believe I now have all of the documents that AECL wants to use in cross-examination with the exception of one that they have said is being forwarded to us overnight. I'm not quite sure who is going next on Tuesday, it may be CEG, and who follows them.

I would just like to ask that if those people are here if they can get documents to us in time for them to be distributed before the weekend I certainly think it is far fairer to the witnesses than producing them like rabbits out of a hat, and I would ask that people do so.

And if I am wrong about my assumption about the documents from AECL, perhaps I would ask them, too.

THE CHAIRMAN: I have been asked to do some forward planning as well for the hearing, and that is that it seems to me there is an interest in whether we are going to sit on Thursday, July the 2nd. The answer to that is no, we are not going to sit on Thursday, July the 2nd.

MR. SNELSON: Perhaps, if I may, I would like to clarify the matter that was under discussion just before the break.

And my understanding was in fact incorrect, that the approval costs were not in twice. The approval costs were separated in the lower load growth case and assumed to have occurred in the early 1990s when the approval processes were going on, the approval and definition phase work and so on necessary to get approval.

They were separated, but they were not repeated.

There is, however, I believe, a significant risk that approvals that are not exercised for seven years or so after they have been obtained may need to be repeated in some respects before they can be exercised.

MR. HEINTZMAN: Q. The DSP, Exhibit 3, contains nuclear, fossil, hydraulic, all sorts of installations that don't occur until 2009 through 2017, I think. Is that not fair?

MR. SNELSON: A. The DSP did not ask for approval for facilities that were required through the whole 25-year period, only those for which an environmental assessment would expect to be submitted within five years.

Q. But the facilities, even the hydraulic and the nuclear and fossil that we see in it, go out to 2009 and beyond?

A. The facilities were laid out for the full 25-year period.

Q. And the approval was being obtained then and there in the DSP; it was being asked for upfront?

A. Not for the full 25-year period.

Q. Well, for facilities out to and including that full period?

I can take to you some of them. They are way out at the end of the period. I was going to do that later. Let's come back to that, unless you have got some reference you want to make right now.

MR. DALZIEL: A. In reference to the hydraulic plant, the approvals that were sought in '89 I believe included the sites or the projects associated with what is called the Abitibi Complex, and in '89 they were shown as coming into service over the period 2000-2004.

Q. Sorry, what page are we on?

A. Well, starting at Exhibit 3, page 19-2.

THE CHAIRMAN: Excuse me for interrupting. Just to take an example right out of the air, looking at Plan 15 it provides for a CANDU "C" and a CANDU "D". In the request for approvals neither CANDU "C" or CANDU "D" are included. Is that what you meant, Mr. Snelson?

MR. SNELSON: I believe we asked for approval for CANDU "A" and CANDU "B".

THE CHAIRMAN: You just asked for CANDU "A" and "B", but the plan itself calls for CANDU "C"s

and CANDU "D"s. So that is the point you were trying to make?

MR. SNELSON: Exactly.

MR. HEINTZMAN: Q. Well, we will come back to that later because I have some more organized thoughts than that.

But the point that you and I were discussing, Mr. Snelson, is that these Plans, 15, 22, 23, were built on a system basis that slid from load growth to load growth; right?

MR. SNELSON: A. Yes, to some degree.

Q. Well, entirely?

A. The assumption was that we had the maximum that we could get from demand management non-utility generation and hydraulic, and that therefore all of the differences between upper and lower load growth would be taken up by changes in the major supply plan.

Q. Yes. And you can adjust the DSM or whatever you wish to, but the major supply portion of the plan, if we look at page 15-10 and -11, and for the units as we see them coming in, and on page 15-9 for the graphic representation of it for Case 15 we can see that in effect the system moves out, if you like, from the lower out to the upper or back from the upper --

historically, you would be ready for the upper and you would move things back as you don't require them to the lower? That was the whole system built into these plans?

A. Yes.

Q. Yes. So that the point I am making is that even though -- and if we look up on the top right-hand corner the lower forecast required generation under Case 15, which if you look at page 30 of Exhibit 682 is very similar, you had been prepared long before 2008 or 2009 with approvals, with definition to the extent thought necessary and everything to meet an upper forecast possibility in 2002 for nuclear generation?

A. You are saying that some of the preparations for the upper would have been that early, and then they would have been used later for the lower?

Q. Yes.

A. Yes.

Q. Yes. So that the whole system was premised on that kind of a sliding system?

A. To a degree, yes.

Q. Well, entirely?

A. There are some options that don't slide. For instance, there are combustion turbines,

not convertible, which are shown as being the first segments of capacity in the upper load growth, which I don't believe are used in any other scenario.

Q. But those were only there because you couldn't get generating up fast enough in terms of construction lead time, definition and acquisition; isn't that correct?

A. They were there because they were the shortest lead time option, and you couldn't get other options in time, yes.

Q. Yes. But everything that was constructible and definable, et cetera, in time, moves on a sliding path from the upper to the median to the lower basically? There may be some exceptions?

A. Yes, I have agreed that basically that is what happens.

Q. So if you arrive at the lower there is no shock in trying to build the construction program that is shown on the top right-hand corner of page 15-11 because you have been ready, willing and able to do all of that long beforehand?

A. In this circumstance, you would have been ready in some respects well in advance of the actual needs or dates that you do things, yes.

Q. And that is one of the logics behind

the DSP and behind the plans and the cases that were put forward?

A. The logic was to be ready in time for the upper, and one of the consequences of that was that you may be ready in good time for the median and very good time for the lower.

Q. Right. And if we compare that to the Update, the Update doesn't provide for a system to get your approvals well in advance to meet the upper case, does it?

A. The Update provides for flexibility by different means.

Q. Can you answer my question: It doesn't provide for obtaining approvals to meet the upper case?

A. It does not.

Q. Yes. And so it doesn't contain, expressly on its face in any event that I can see, any system of moving generation in this consequential fashion that is expressly built into Plan 15 and the other plans, does it.

A. It hasn't laid out in the same way upper and lower and median scenarios.

Q. Yes.

A. We have given you upper and lower and

median scenarios in our documents.

Q. Well, I will be coming to the upper case, but your upper case is not a case built on or arising from the median case construction; in fact, your upper case is a case that is both a nuclear and fossil upper case?

A. That is correct.

Q. And it doesn't bear any graduating or connection basis to your median case, does it. We can look at it. It has got all sorts of units in it that aren't in the median nuclear case.

A. Well, as we have indicated, the median case does not seek approvals within the next five years. The upper case is built on the premise that if you have not sought approval within this time period, then what sort of would be a reasonable plan based upon that in developing into the future.

Q. But you have agreed with me that your upper case, as and to the extent it is presented in the Update, doesn't bear this graduated relationship to the median case such as the DSP expressly provided for?

A. The cases for major supply beyond the period where we are seeking approvals, then, as we have indicated, we haven't made choices, and so the median cases, we show a median case with nuclear future beyond

2009, we show a median case with fossil beyond 2009. We haven't selected between those. And the upper load growth case includes some features of both of those.

Q. So the upper case you put forward in the DSP isn't built on a graduated and consequential basis on the median as are the plans in the DSP?

A. The relationship is not the same.

Q. Yes. Thank you. And the necessary result of all that is until there is another DSP hearing, if this Board doesn't give approval for major supply, Hydro cannot proceed with definitional work on major new supply?

A. No, that is not true.

Q. And why is that?

A. Ontario Hydro does not need environmental assessment approval to conduct definition phase studies.

Q. So you say you are going to go ahead with definition phase studies...when?

A. When we see them as being necessary.

Q. So it could be tomorrow?

A. Theoretically, but I don't think practically so.

Q. Why? Because of the nuclear moratorium?

A. Well, we could go ahead with definition phase studies on a new coal-fired plant or a new gas-fired plant, and the nuclear moratorium is immaterial to that.

Q. But you can't go ahead on definitional phase because of the nuclear moratorium on nuclear?

A. That is correct.

Q. And your approach, in my submission -- and I suggest to you, and I don't want to go over the ground that Mr. Mark has already gone over with you where he discussed with you the costs that your approach has if you go into the definitional phase, and you will recall your discussion with Mr. Mark on Exhibit 452D, or maybe it was Mr. Shalaby or Mr. Dalziel who discussed that.

I am going to assume that Ontario Hydro does nothing more with its approval than wait until it would otherwise wait under your scenarios to go ahead with definitional work, and I am not going to get into the debate in Exhibit 452 as to what the costs of planning to the upper are if you start definitional work.

Are you with me?

A. I think so. I am waiting for the

question. I will see if I understand the question.

Q. I think you agreed with Mr. Mark that the first cost is that you are going to have to have a new DSP hearing if this Board doesn't approve major new supply? You will have to have the cost of a new DSP hearing?

A. There will be the costs of whatever approval processes are appropriate, and for obtaining environmental approval of major supply additions that can either be done as a two-stage process with a plan hearing and project-specific hearings as we are doing it now, or it could be done as a one-stage process.

Q. Well, whichever way it is done there is going to have to be a rationale hearing separate or as a part of a site-specific hearing?

A. Either separate or as a part of, yes.

Q. And that is going to require an additional cost, both as to out-of-pocket money and time?

A. Yes.

Q. And the second cost I have just reviewed with you; that is, the cost or the potential cost of pushing all of your construction into seven-and-a-half-years and being hostage to the economic circumstances that exist at that time? That

is a real cost, isn't it.

A. There is some element of cost risk associated with it.

Q. Yes. And the third cost is the cost of eliminating potential options that you might have selected but you can't select because you pushed off your planning horizon; right?

A. There is the potential for such a cost if processes are delayed beyond the lead time of the longest option.

Q. Yes. And that is expressly dealt with at page 13-7 of the DSP. Could you turn with me to that page - page 13-7 of Exhibit 3?

About halfway down the first paragraph on the lefthand side:

> Some options can be put in place in two to three years while other options take seven to 14. Since long lead time options often have economic and other advantages planning that restricts itself to short horizons will not result in a balance of options which best serve the long-term electricity requirements of the province.

That is a correct statement; is it not?

A. Well, I am not sure whether you are looking at the same version that I am looking at, but the numbers in my version are different to yours. You said that some options can be put in place in two to three years.

Q. Sorry, two to five years.

A. Mine says two to five. And then you said other options take seven to 14, and it says eight to 14 in my copy.

Q. Well, I am going to have to go back and read the transcript because mine says the same, and I thought I said that.

A. Well, I'm sorry, if I misheard you, but...

Q. But I was concentrating on the next sentence, that:

> Planning that restricts itself to short horizons will not result in a balance of options which best serve the long-term electricity requirements of the province.

That is a true statement?

A. That is directionally a true statement, yes.

Q. Yes. And to the extent --

MR. SHALABY: A. It starts, however, with: Since long lead time options often have economic and other advantages...

Mr. Snelson started saying that some of the long lead time options are starting to lose some of that advantage over the short lead time options, so I think that is a fundamentally different situation today than it used to be at that time.

Q. Well, is it not still true that long lead time options often have economic and other advantages?

A. But today we indicate that that advantage is diminished from the way it was three or four years ago.

MR. SNELSON: A. Not eliminated; it is diminished.

Q. It is diminished as you perceive it between some options?

A. Yes.

Q. And to the extent that you eliminate that choice that is a cost, isn't it?

A. If that choice was the most economic choice, then there would be a cost associated with it.

Q. And the paragraph continues:

It is prudent, therefore, to undertake

commitments to major supply in a way that allows maximum flexibility to respond to uncertainty. There is a long chain of activities needed to put major supply options in place (design and studies, approvals, construction). Therefore, it is important to move forward with the required design and secure the required approvals while holding off the commitment to construction until the year of need becomes clear.

That is a true statement?

A. Yes, and subject to the qualifications that I gave in my direct evidence and Mr. Shalaby has reminded you of.

Q. Yes. And another cost, and it is a related cost, is the cost imposed by shrinking or putting shrinking pressure on the definitional phase of a project?

There has been quite a debate and exploration of that within Hydro, particularly in the nuclear cost inquiry.

Are you aware that by taking a good deal of time in the definitional phase, spending your time getting things right, you save tremendous amounts of

money in the acquisition stage?

A. I understand that that is one of the conclusions of the cost and schedule reduction studies for nuclear.

Q. Yes. And you had a discussion, which I won't take you to, Mr. Shalaby, with Dr. Connell in Volume 49 and Volume 60 on that same point, that if you press down on your definitional phases you could end up spending a lot more money in your acquisition phase? Do you agree with that?

MR. SHALABY: A. I accept what was said earlier, yes.

Q. Fine. And to the extent that by pushing off the approvals date to, let's say, 10 years before your nuclear installation is required - and that is the minimum time that is required - then you are putting the maximum pressure on you to do your planning and to be ready for construction, aren't you?

[4:30 p.m.]

MR. SNELSON: A. As I have said, the approval date that we are talking about is the time when an environmental assessment is submitted. Some definition work can precede that.

Q. But to the extent that you delay your approvals and to the extent that you put pressure on

your definitional phase, you are going to run into risks in terms of increased costs; aren't you?

A. There are balances that have to be made between having enough time to do a sufficient amount of preliminary engineering during the definition phase, that, as you have put it, you can build the plant right instead of building it wrong and then building it right again.

Q. Yes.

A. So there is a balance between that and there is a balance between the need to avoid spending money, avoid making decisions that lock you in before you need to.

Q. But if you have the flexibility to do either, then you are maximizing your choices and you are minimizing your costs; aren't you?

A. There are advantages in starting soon enough to have time to do a good definition phase study, yes.

Q. Right. Thank you.

And when we look at this program you have got on pages 29 and 30 of Exhibit 682, I guess this line which is now the median showing 8,700 megawatts, the risk again - and this translates into costs - is that you may have to do lot more than that, but that

could happen and that's an additional cost; isn't it?

A. I'm sorry, I didn't quite capture what is the additional cost.

Q. That you may have to do more earlier than is shown on pages 29 and 30.

A. More of what?

Q. More generation.

A. Yes.

Q. You may have to do it earlier?

A. Yes, that would be the sort of circumstance under the upper load growth scenario.

Q. And to the extent that you are not ready for it, to the extent that you don't have approvals, to the extent you have to do it earlier and more of it, that's going to add increased cost; isn't it?

A. It may do.

Q. Yes. And that can happen by virtue of any number of circumstances including increased demand; right?

A. Yes.

Q. Decreased success of your demand/ supply management and NUG program?

A. Yes.

Q. A decision not to proceed with your

fossil extensions?

A. Or shorter lives of fossil plant.

Q. Yes. Or increased demand of electricity to meet increased environmental standards in Ontario. That's a possibility, too; isn't it?

A. Sorry, increased?

Q. Use of electricity because of the increased environmental standards imposed by Ontario?

A. That's one circumstance that under some circumstances could contribute to higher load growth.

Q. Yes. And all of those are going to result in higher costs in a circumstance where you don't have the time or as much time or as much flexibility as you would have if you had got your approvals earlier and had embarked on your planning earlier; right?

A. Theoretically, yes. But I think the point that one has to come to here is that when you are planning for upper load growth and you are trying to maintain flexibility for upper load growth, then you can't usually plan on having the most economical program to meet the upper load growth. You have to plan on a plan that is reasonably economical under median load growth and has the capability to at least

maintain reliable supply without excessive costs in upper load growth.

So in the 1989 Demand/Supply Plan, the need time for generation under upper load growth was about 1993 as Mr. Dalziel has said. And that plan for upper load growth managed through to 2002 with combustion turbines and other such options until you could put a base load supply in at about the time that you were actually planning on it for median load growth, and that difference between when you need generation and when you bring in the base load option was about nine years.

In our current circumstance --

Q. Where do you get the nine years?

A. '93 to 2002.

Q. I think we said eight years before, but okay. Go ahead.

A. I am just giving you the principle.

Mr. Shalaby has pointed out to me that we actually put in some generation somewhat ahead of that in the median.

But the point I am getting at is that you need generation around 1993 in upper load growth and your first base load addition is 2002, which is about nine years after you need some generation, and it is

actually one year earlier than you put in the base load plant under median load growth.

We are in the very similar situation today as regards to those times. We see the first steady and significant need for generation under upper load growth around the year 2002, and the current plans are thinking about having base load options available around the year 2009, which is about a seven-year gap between them.

So it's not as though in this current plan we have to struggle along with combustion turbines under upper load growth for a much longer period than we did under the 1989 Demand/Supply Plan. They are actually quite similar.

Q. I agree with you 100 per cent. That's the point I have been trying to make and I am grateful for you pointing that out.

I was curious in this process of this just-in-time planning. Was it you, Mr. Shalaby, or you, Mr. Snelson, who coined that phrase, just-in-time planning?

MR. SHALABY: A. Actually, it was president of the company, but we introduced it here.

Just-in-time planning is in the -- just-in-time commitment is mentioned in the exhibits,

and I think we both mentioned it some time or another.

Q. I suggest to you that just-in-time planning is an oxymoron. It's a contradiction.

A. Just-in-time commitment is the word that I used.

Q. You will agree with me that just-in-time planning is a contradiction.

A. You introduced the term, you can explain it better than I can.

Just-in-time commitment is the word that we use.

Q. We can look at the transcript as to what was said.

But you will agree with me that just-in-time commitment takes a lot of planning.

A. Yes.

Q. In fact, the Japanese who have perfected just-in-time delivery of deliveries have developed tremendous planning to accomplish just-in-time deliveries for inventory control. Are you aware of that?

A. No, but I can accept that.

Q. You're right, on page 18-1 of the report, Exhibit 3, on the right-hand column: This permits just-in-time commitments. And that's all based

on the whole long-term planning inherent in the DSP, isn't it, without which that just-in-time commitment is impossible.

A. I agree.

Q. Yes. And that's the whole philosophy behind the DSP, to have long-term planning so that you can have just-in-time commitment; right?

A. Yes.

Q. And I suggest to you without long-term planning you won't get it.

And I would ask if we can just look at a speech that Mr. Franklin gave on this point. I think I have given to the members of the panel a copy of that.

THE REGISTRAR: Do you want this marked, Mr. Heintzman?

MR. HEINTZMAN: Yes, it may be marked.

THE REGISTRAR: 691, Mr. Chairman.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 691: Speech of Mr. R. Franklin, President and CEO of Ontario Hydro, June 13, 1990, entitled Integrated Long-Term Planning and the Nuclear Option.

MR. HEINTZMAN: Q. Mr. Shalaby, are you familiar with this speech of Mr. Franklin, President and CEO of Ontario Hydro, on June 13th, 1990?

MR. SHALABY: A. I can't say I am

familiar with it, no. I have seen it. You handed it to us yesterday.

Q. Yes. Let's turn to page 1.

A. I didn't read it all of it.

Q. This speech was given to explain Ontario Hydro's commitment to the DSP process; right? Mr. Shalaby, that's a fair statement of what this speech --

A. I think it is given to American Public Power Association and the title of the speech is Integrated Long-Term Planning and the Nuclear Option.

Q. Yes. And in the third paragraph, Mr. Franklin say:

> I have been asked to discuss the issue of long-term planning and the absolutely crucial role it plays in our business. More specifically, I have been asked to speak to you today about Ontario Hydro's recently published 25-year plan.
>
> Utility planners have never faced more obstacles in getting their plans on paper and into practice. Increasing government regulation, rising public concern for the environment, scarce resources, global competition and the rise of powerful and

influential special interest groups have combined to make an already imprecise science even more precarious.

Do you agree with that?

A. You are putting me in a tough position of agreeing or disagreeing with the company president, or a previous one.

I generally agree with it, yes.

Q. Ontario Hydro is proposing $62 billion of electrical projects over a 25-year period. Many people in the business are asking why. It is we are planning to swim against the stream. We think we have no choice but to plan a full generation ahead.

And at the bottom of the page he says: But forecasts however problematic are unavoidable. For one thing, they are critical because at Ontario the lead time for getting a major more new base load station designed, approved and built can be as long as 14 years.

Do you agree with that statement?

A. That was the information in our exhibits, consistent with it, yes.

Q. Yes. The next page:

To restrict ourselves to planning only for the short term would be to deny ourselves and our customers good, environmentally sound, reliable, safe and cost-effective options.

Do you agree with that statement?

A. Generally, yes.

Q. Dropping down one paragraph:

The bottom line for Ontario Hydro is that despite the drawbacks, we felt we couldn't afford not to make the fundamental commitment to balanced, long-term planning.

Do you agree with that?

A. Yes.

Q. The next paragraph:

In some ways our historical role as Ontario's virtual sole supplier of electricity and the pivotal role that electricity has played in the development of the province is unique. It certainly makes possible a far longer term planning horizon that might be possible for many of you.

Referring to the Americans.

Do you agree with that?

MR. SNELSON: A. I think there might be a little hyperbole there in suggesting that our situation is unique.

Q. Well, leave out the uniqueness. Do you agree with the statement about the role of Ontario Hydro?

A. Generally, yes.

Q. Let's turn to the next page. Page 3, fourth paragraph:

> Sure there is a role for short-term ingenuity and resourcefulness. I'm a family man and I am not one to scoff at the usefulness of Band-aids, but we also have to have a vision and a plan for what we want to bequeath our children.

Do you agree with that, Mr. Shalaby?

A. I think this comes to some of the issues that I talked about in the rationale for the approvals that we are seeking--

Q. It certainly does.

A. --in that the long-lived nature of the transmission associated with the Manitoba Purchase and with the hydraulic options is in a sense an

investment by this generation for the benefit of this generation, but particularly for the benefit of future generations.

Q. So I take it you agree with that statement in that paragraph?

A. Generally, yes.

Q. And you do, Mr. Shalaby?

MR. SHALABY: A. I do.

Q. And he drops down one paragraph:

> After all the issues, statistics and scenarios had been evaluated, we were left with one agonizing question. Would the traditional, medium-term, step-by-step planning approach we had used in the past work once more? Or did the times call for a more comprehensive and inclusive planning strategy?
>
> We opted for the latter. A strategy where all demand and supply options would be analyzed and debated, and a strategy which invited the public to voice its opinion as to what kind of a power system it wanted.

Do you agree with that, Mr. Snelson?

MR. SNELSON: A. Yes, and that's

happened through the development of the demand/supply planning strategy.

Q. Our objective was to achieve balance. Do you agree with that, Mr. Snelson?

A. Yes.

Q. And then dropping down one further paragraph:

> We had to balance the short-term against the long-term, and most fundamentally we had to achieve balance between supply and demand over time.

Do you agree with that?

A. Yes.

Q. Dropping down to the next page, page 4, the bottom of the page:

> The balance in our 25-year plan gives us flexibility to accommodate the inevitable unforeseen situations. We have to be able to meet higher than expected demand or lower than expected demand, to accept higher than anticipated response to conservation initiatives or from private suppliers. We have to be able to accommodate delays in construction whether caused by technical

or economic problems.

Do you agree with that?

A. Yes.

Q. On page 5, second paragraph:

This flexibility has a cost but we see this as a necessary insurance premium.

Do you agree with that?

A. In principle, yes. We believe that our current planning around the median approach provides the right balance between the cost and flexibility in our current circumstance.

Q. Well, Mr. Franklin in a portion of his special, which thankfully you agreed with, on the previous page it said:

We have to be able to meet higher than expected demand.

You agreed with that when I read it to you.

A. Yes.

Q. Dropping down to the bottom of page 5:

Although this can be time consuming and burdensome - and he has referred to all of the environmental hearings that you have to go through in Ontario - it

should result in a stronger consensus and a more reliable foundation for long-term planning.

Do you agree with that?

A. That is one possible outcome of this hearing. It would be a desirable outcome.

Q. It's one that you want. It's one that Mr. Franklin wanted. Is it one you want?

A. Well, I think we have already testified as to what we want from this hearing. We want certain approvals and there may be other matters that are discussed through that process, but primarily our purpose is to obtain the approvals requested.

Q. Well, Mr. Franklin was speaking to the DSP, the choices that were contained in the original DSP; wasn't he?

A. Yes, he was.

Q. And he was asking for a debate and a consensus on those choices; wasn't he?

A. He was asking for that, but you have to put that in the context of the situation at the time.

Q. He was asking for a debate and a consensus on those approaches; wasn't he?

A. Yes.

Q. Page 6:

In the 25-year plan we have defined our undertaking as a program to provide electricity services. We have included in the application a case for the need for electricity and a menu of alternatives for meeting that need. This menu includes new nuclear and fossil stations on a number of potential sites, transmission capacity, private suppliers, management or demand and purchases from other Canadian utilities. We are asking in phase 1 for the Board to consider the broad plan and to accept our plan for need and the technologies and the methodologies for meeting that need.

Dropping down further:

This first phase hearing process will provide a context with a legal underpinning for the environmental discussion of the individual projects to be heard in Phase 2.

That was the purpose of the DSP.

A. Well, I would use as the purpose of the DSP the precise definition of the -- that is given

in Chapter 19 of Exhibit 3, and in the update document, Exhibit 422.

What gets written in speeches tends to be a little liberal interpretation of precise sets of words.

Q. Well, Mr. Franklin wasn't just referring to Chapter 19, he was referring to the whole DSP.

A. But Chapter 19 of the DSP refers to what is our definition of the undertaking and what approvals that we were requesting at that time.

Q. Yes, but you can't have a debate unless you have got the elements on the table; can you?

A. That is correct.

Q. And you can't have the debate unless you have got chapters 1 to 18 to tell what you chapter 19 means; can you?

A. That is correct.

Q. Further down page 6:

> We could have gone to the Board on a case-by-case basis as we needed more generation. If we had done this, then every time Hydro made an application for new generation we would have to discuss the alternatives, load forecast and

generic affects for the generation request, as well as the site-specific components of the project. We would have to reinvent the wheel with each application. This approach would be extremely time consuming. It would probably result in the most difficult decisions constantly being put off until later.

Would you agree with that, Mr. Snelson?

A. Certainly one of the reasons for bringing all of the approvals together in the 1989 Demand/Supply Plan, all the approvals of rationale and need, was to avoid the duplication of debating all the need issues in each individual application, and also of the possibility of conflicting decisions with respect to individual applications.

Q. Do you agree with the statement that I just read from Mr. Franklin's speech? Do you want me to read it again?

A. Generally I agree with it, yes.

Q. Thank you.

[4:50 p.m.]

Just before the last page, page 8, at the bottom of page 8:

Our size also allows us to consider a blend of small and large stations. At the same time, if demand does not follow the predictions we can alter schedules on the smaller units as necessary without incurring the extremely high costs of altering the schedules of a nuclear station.

Do you agree with that statement?

A. The 1989 Demand/Supply Plan did move around the in-service dates of the combustion turbine units, and so on, and had less movement in the nuclear stations, and to that extent I agree with it.

Q. Yes. And he is suggesting that that is a desirable thing, that you can leave the larger nuclear stations with their planned in-date service and move the smaller components as and when necessary, as you have pointed out in Plan 15 from time to time?

A. I wouldn't call that a desirable feature. I would call that a response to the difficulty in moving around the in-service dates of nuclear units, and rather than actually move the in-service dates of the nuclear units themselves it is preferable from a planning perspective sometimes to be moving around the in-service dates of other components.

But that is more a response to the inflexibility of the nuclear units than it is by itself a desirable feature.

Q. But the integrated plan allows you to do that?

A. An integrated plan allows you to do that.

Q. And finally, on page 9 I guess Mr. Franklin can foresee the future:

> Ontario Hydro obviously has set itself a mammoth task in proposing a 25-year plan with a large nuclear component. It would be foolish for me to suggest that everything will go according to that plan or there will be anything other than a tortuous or difficult process.

I guess Mr. Franklin was right on that, wasn't he.

A. I certainly have spent a lot of time here, and it seemed rather tortuous and difficult at times.

Q. Now, let's turn from analyzing the various plans to looking at your upper case, and that is to be found in Exhibit 646, as I understand it, attachment D.

I am going to be spending a few minutes

on this, Mr. Chairman. Would you prefer to stop now, I am entirely in your hands.

THE CHAIRMAN: I think it might be a good idea to stop now, Mr. Rodger has something he wants to say. Well, just a moment, Mr. Rodger. We will start again on Monday morning and continue this. Mr. Rodger?

MR. RODGER: Mr. Chairman, I have spoken with counsel for the Canadian Nuclear Association and he asked me to inform the Board that the Canadian Nuclear Association will be relying on the cross-examinations of AMPCO and the MEA and will have no questions for this panel.

THE CHAIRMAN: Thank you, Mr. Rodger. I don't know, Mr. Heintzman, whether you should be offended by that or not, but... [Laughter]

MR. HEINTZMAN: Ms. Findlay says, "He hasn't read the transcripts yet."

THE CHAIRMAN: We will adjourn until Monday morning at ten o'clock.

THE REGISTRAR: Please come to order. This hearing will adjourn until ten o'clock Monday morning next.

---Whereupon the hearing was adjourned at 4:55 p.m. to be reconvened on Monday, June 1st, 1992, at 10:00 a.m.

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